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Profile of Maternal Deaths: A Three Year Autopsy Based Retrospective Study in Western Maharashtra Region

Satin Kalidas Meshram[1], Santosh Baburao Bhoi[2], Sushim Amrutrao Waghmare[2], Rizwan Allaudin Kamle[3], Kunal Bhimrao Shirsat[3]

Abstract

Aims: This retrospective study was carried out to know the different epidemiological aspects of maternal deaths. *Material and Method:* This three year retrospective study was carried out in department of Forensic Medicine & Toxicology, Dr Vaishampayan Memoral Government Medical College Solapur, Maharashtra from January 2014 to December 2016. This study is based on the medico-legal autopsy record of Maternal deaths. *Results:* Overall MMR of the Institution was 369 and the incidence of maternal deaths due to obstetric causes as compared to overall medico-legal autopsies was 1.70 for the study period respectively. Most of the deaths occurred in the age group 21 to 25 i.e. 42.71%. Urban deaths were more 57.28% as compared to rural population. Hindu population deaths were 66.99% as compared to Muslims and other religious groups. 48.31% of deaths took place at tertiary care unit. In 38.83% of cases the tertiary care unit was within reach that is less than 10 km from the place of residence. 33% of deaths have taken place in between 12 pm to 6 pm. *Conclusion:* Maternal death is social injustice and to be dealt with sensibly.

Keywords: MMR; Maternal Mortality; Autopsy.

Introduction

A maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes [1]. Pregnancy-related death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death [1].

Maternal mortality ratio is defined as the number of maternal deaths per 100,000 *live births*, a measure of the risk of death once a woman has become pregnant [2].

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Maternal mortality rate (MMR) is dependent upon the general socioeconomic status, nutrition level and the level of maternal healthcare in the community and it is recognized as a social indicator [3]. The MMR of year 2015 [1] of developing nations like India (174), Pakistan (140), Bangladesh (176) showed that it is much higher than developed nations like United Kingdom (08), USA (28) and Russian Federation (24). The condition of underdeveloped Nations of Central African Republic is worst than the Asian zone with MMR 882.

In most of the developing countries, maternal deaths are the tip of iceberg, which signal everyday tragedies of women's lives and reflect how world's poverty has been feminized [4].

Hence this study is designed to study the profile of maternal deaths to know the various epidemiological factors including incidence, distribution and possible control of factors relating to maternal deaths.

Material and Method

This 3 year retrospective study was carried out in the Department of Forensic Medicine and Toxicology,

Dr Vaishampayan Memoral Government Medical College Solapur, a Western Maharashtra region from January 2014 to December 2016.

This study is based on the record of maternal deaths that had been brought for medico-legal autopsy in the department. The detailed pertaining to age, area of residence, marital status, religion, place of delivery, distance of tertiary care from the place of residence or place of referral, time of death have been taken from post mortem memorandum and investigating agencies documents submitted for requesting autopsy such as panchanama and treatment record. The data was entered on predesigned data sheet to maintained uniformity, tabulated and then statistically analyzed.

Inclusion Criterion

All the maternal deaths brought to the department during the study period either directly or indirectly related to the complications of pregnancy.

Exclusion Criterion

All the un-natural maternal deaths.

Ethical Committee Clearance

As the data was retrospectively collected and as no revelations of identity ethical committee clearance not required.

Conflict of Interest and Sources of Funding: None

Results

A total 6057 medico-legal autopsies have been done during the three year of study period out of which a total 103 autopsies have been contributed to Maternal deaths hence on an average the percentage was 1,70% (Table 1). A total 27852 females have been admitted in the Institution for delivery hence the Maternal Mortality Ratio was to be 369 (Table 1).

In our study no case has been reported as below the age of 18 years. Maximum 44 (42.75%) deaths were observed in the age group 21 to 25 years. A total 65 (63.10%) cases were in the age range below 25 years of age (Table 2).

Urban deaths were more i.e. a total 59 cases (57.28%) as compared to rural locality 44 cases (42.71%) (Table 3).

As regard to religion maximum cases have been observed in Hindu religion 69 cases (66.99%) followed by other religious groups predominantly Buddhist and Lingayat sect. 25 cases (24.27%) as compared to Muslims 9 cases (8.73%) (Table 4).

Maximum patients 43 (48.31%) have been delivered at our Institute working as a Government Medical College and Tertiary care unit of State in the studied region. A total 17 cases (19.10%) have been treated at Rural Governmental health facilities including Primary Health Center and Rural Hospital/General Hospital. Hence a total 60 (67.41%) cases have been availed the government health facilities. 21 cases (23.59%) have been treated in private hospitals. And only 8 cases (8,98%) have been delivered out of the ambit of health facilities hence devoid of skilled technical staff during the delivery. 14 cases have died before hospitalization (Table 5).

For 40 cases (38.83%) the Government run Multispecialty Institute in the form of Medical College as a tertiary care unit was within the reach i.e. less than 10 k.m. from the place of their residence. A total 42 cases (40.77%) were residing in the range of 11 to 50 k.m. But for 21 cases (20.83%) the government run tertiary care unit was more than 50 k.m. (Table 6).

Table 1: Showing Maternal Deaths and MMR

Year	Total medico-legal autopsies	Maternal deaths	Percentage	Total females admitted for delivery	MMR
2014	2014	25	1.24	8429	296
2015	2048	42	2.05	9217	455
2016	1995	36	1.80	10206	352
Total	6057	103	1.70	27852	369

Table 2: Age wise distribution of cases

Age Group	Number of Cases	Percentage
15 to 20	21	20.38
21 to 25	44	42.71
26 to 30	25	24.27
31 to 35	12	11.65
36 to 40	1	0.97
Total	103	100

Table 3: Residence wise distribution

Residence	Number of Cases	Percentage
urban	59	57.28
Rural	44	42.71
Total	103	100

Table 4: Religion wise distribution

Religion	Number of Cases	Percentage
Hindu	69	66.99
Muslim	9	8.73
Other	25	24.27
Total	**103**	**100**

Table 5: Place of delivery wise distribution (N=89).

Place of Delivery	Number of Cases	Percentage
PHC	8	8.98
RH	9	10.11
GMC	43	48.31
PVT	12	13.48
Pvt multi	9	10.11
Home	7	7.86
farm	1	1.12
Total	**89**	**100**

14 cases remain undelivered with the product of conception in womb before death.

Table 6: Distance of state government tertiary health facility from residence at the time of delivery

Distance	Number of Cases	Percentage
Within 10 km	40	38.83
11 to 20	5	4.85
21 to 30	8	7.76
31 to 40	15	14.56
41 to 50	14	13.59
Above 50	21	20.38
Total	**103**	**100**

Table 7: Time of death wise distribution

Time in AM/PM	Number of Cases	Percentage
12 am to 6 am	21	20.38
6 am to 12 pm	22	21.35
12 pm to 6 pm	34	33.00
6 pm to 12 am	26	25.24
Total	**103**	**100**

Most of the deaths occurred between 12 pm to 6 pm during the day time 34 cases (33.00%) but there was no significant difference between the maternal death and time quarter and the deaths have been uniformly occurred in all time slots (Table 7).

Discussion

Maternal Mortality Ratio

In the present study a total 27852 females have been admitted in the Institution for delivery hence the Maternal Mortality Ratio was to be 369.

In India, the Maternal Mortality Ratio was 174 in the year 2015 [1] and the Maternal Mortality Ratio of Maharashtra was 68 [5].

Hence the MMR in present study was considerably higher than the National as well as the ratio of the State. This may be explained based on the fact that this Institution is a tertiary care unit and complicated cases from peripheral areas are referred to this hospital

Ann L Montgomerry et al [6] reported MMR of Urban India as 245 and that of rural parts to be 397, Jadhav et al [7] (Solapur, Maharashtra) MMR to be 395, Madhuri Badrinath et al [8] (North Karnataka) MMR as 277.19, Hence our findings are consistent

with these studies But Panchabhai et al [3] reported MMR to be 827 form Mumbai, Maharashtra, Pal Amitava et al [9] (West Bengal) as 623, Ratan Das et al [10] (West Bengal) as 518.48, Chakraborti S et al [11] (Kolkata) to be 494.33. Our findings are thus in consistent with studies from tertiary care institution reported MMR ranged between 213 to 879 per 1,00,000 live births.

Age

In our study no case has been reported as below the age of 18 years. Maximum 44 (42.75%) deaths were observed in the age group 21 to 25 years and 24.27% in the age group 26-30 years. A total 65 (63.10%) cases were in the age range below 25 years of age.

Ann L Montgomerry et al [6] al study from India reported 30.5% cases in age range 20-24 years and 20.1% in age range 25-29 years Jadhav et al [7] reported 42.40% in age range of 20-24 years from the study at Solapur, R V Bardale et al [12] (Nagpur, Maharashtra) recorded 52.38% in a age group ranging 21-25 years and 38.09% in the age group of 26-30 years, Madhuri Badrinath et al [8] (North Karnataka) reported 46.66% and 31.11% in the age range 21-25 and 26-30 years respectively, Shobha Mukkherjee et al [13] (U.P) 33% (21-25 years) and 35% (26-30 years) Sibram Chatopadhyaya et al [14] (West Bengal) 20-30 years age group 41%, Vidyadhar Bangal et al [15] (Loni, Maharashtra) 55.27% in the age range 19-24 years, Ratan Das et al [16] 67.17% below 25 years of age. Clara Menedez et al [16] (Mozambique) reported 48.9% in age range 21-30 years, Hence our study was in consistent with other studies as regard to age and maternal deaths.

P.N Makinga et al [17] (South Africa) 18 % in 20-24 years and 29.5% and 23% in age range 25-29 and 30-34 years age group respectively. Hence we slightly differ with study at South Africa and late age of marriage as compared to India might be the reason for this.

Locality

In our study Urban deaths were more i.e. a total 59 cases (57.28%) as compared to rural locality 44 cases (42.71%).

Ann L Montgomerry et al [6] al study from India reported locality wise distribution as Rural 86.3% and Urban to be 13.7%, Jadhav et al [7] (Solapur) reported the distribution as Urban 64.55% and Rural to be 35.44%, Pal Amitava et al [9](West Bengal) noticed urban distribution to be 38.34% and rural to be 61.66%, Ratan Das et al [10] (West Bengal) and Vidyadhar Bangal et al [15] (Loni, Maharashtra) in their study have none of the population from urban area.

Hence our study does not coincide with the studies of Ann L Montgomerry carried out considering the entire Nation showing more rural deaths as compared to urban. Also it sharply contradict with the studies of Ratan das et al and Vidyadhar Bangal et al where none of the case from urban area as their study was in rural area only.

Religion

In this study, as regard to religion maximum cases have been observed in Hindu religion 69 cases (66.99%) followed by other religious groups (predominantly Buddhist and Lingayat) 25 cases (24.27%) as compared to Muslims 9 cases (8.73%)

Ann L Montgomerry et al [6] reported 79.3% Hindu, 16.9% to be Muslim and others comprises of 3.8% from the data across India. The study region predominantly comprises of Hindu population and majority of other religious groups were from Buddhist and Lingayat community.

Place of Delivery

In this study place of delivery was PHC in 7.76%, RH in 8.73%, GMC in 47.57%, Private Maternity homes in 16.50%, Private Multispecialty hospitals in 11.65%, Home deliveries followed by referral to Government Medical College in 6.79% and 0.97% in farm at open place. Ann L Montgomerry et al6 from the data from India reported 49.7% home deliveries, 13.8% deliveries in transit and 36.5% deliveries at health facilities.

Vidyadhar Bangal et al [15] (Loni, Maharashtra) reported home deliveries in 9.67%, Private hospitals in 22% and tertiary care unit in 64.51% of cases and PHC/RH in 3.22%. R V Bardale et al [12] (Nagpur Maharashtra) reported hospital deliveries in 77.77% and at home in 22.22%. P.N Makinga et al [17] (South Africa) reported the availing of health facilities in 75% and home deliveries in 25.5% of cases. Hence in our study only 7.76% deliveries have taken place out of the ambit of health facilities and was in consistent with Vidyadar Bangal et al the study belonging to nearby region and was in contrast with all other studies in this respect. This was explained by the fact that the Government Medical College was within the range of 50 k.m. in 79.59% of cases and for 38.83% it was within the reach of 10 k.m.(Table 6).

Time of Death

Most of the deaths occurred between 12 pm to 6 pm during the day time 34 cases (33.00%) but there was no significant difference between the maternal death and time quarter and the deaths have been uniformly occurred in all time slots.But the observed values were in contrast to this hypothesis. No such study in this arena was found in the literature.

Conclusions

Primary Health Care Centers, Rural and General Hospitals will be equipped with more skilled personals and advanced equipments to treat the mothers in morbid state so as to ensure rapid diagnosis and treatment in high risk cases. The death of pregnant women is a social injustice and human rights violation and preserving mother life should be dealt with war footings.

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Original Article

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Practical Problems Encountered in Conducting Medico-Legal Autopsies in Custodial Deaths: A Research Study

Abhaykumar B. Dheeraj[1], Sudhir D. Nanandkar[2]

Abstract

To ascertain the cause of death is the most important objective behind a medico- legal autopsy. To this objective, ruling out torture or any other form of forceful activity done by the authorities is added while performing the custodial deaths' autopsy. Medico- legal autopsy of custodial deaths has to be prompt and precise, to achieve such objectives and to collect evidences. National Human Rights Commission (NHRC) has laid down certain guidelines at different levels at regular intervals to achieve the objectives behind custodial deaths' autopsy. Authorities working under these guidelines encounter different problems at their level. This study was aimed at identifying few of those problems, analyzing them and find out solutions in the form of recommendations on the basis of conclusions drawn.

Keywords: Custodial Death; Autopsy; National Human Rights Commission (NHRC); Problems.

Introduction

Ascertaining the cause of death is the most important objective behind a medico- legal autopsy. To this objective, ruling out torture or any other form of forceful activity done by the authorities is added while performing the custodial deaths' autopsy. The international community has recognized the growing importance of strengthening national human rights institutions. In this context, in the year 1991, UN-sponsored meeting of representatives of national institutions held in Paris, a detailed set of principles on the status of national institutions was developed, these are commonly known as the Paris Principles. These principles, subsequently endorsed by the UN Commission on Human Rights and the UN General Assembly have become the foundation and reference point for the establishment and operation of national human rights institutions[1]. The principles and philosophy related to protection of human rights and delivering justice to the victims of custodial deaths is very well reflected in the Protection of Human Rights Act (PHR-Act) [2] and guidelines issued by National Human Rights Commission and Government from time to time.

Delay in transport and inquest, problems pertaining to mandatory requirements of evidence preservation by videography and many more still exists**.** If the same situation continues, it will defeat the very purpose of giving natural justice, in a just and pure manner to the victims, which off course not expected by PHR-Act and National Human Rights Commission guidance. Finding out cause and manner of death being main objective of autopsies in such important and sensitive cases, the present situation discussed above defeats the very purpose of fulfilment of this objective. This study was aimed at identifying the problems, analyzing them and find out solutions in the form of recommendations on the basis of conclusions drawn.

Material and Methods

The present study was conducted at Mortuary of Department of Forensic Medicine & Toxicology at Grant Government Medical College & Sir J.J. Hospital Mumbai, which is an authorized regional referral

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centre for conducting autopsies in alleged custodial deaths. The study comprises of total 82 (Eighty Two) autopsies of custodial deaths which were referred for post-mortem examination by the Magistrate from various custodies in the region. The study was carried out for a span of two years. Each and every case under the heading of custodial death and quasi custodial were attended personally and data was collected in the standardized Performa.

Results

Table 1. It is observed that in maximum number of cases (51 cases) i.e. 62.96% of total cases the time interval for magistrate inquest to commence is 10-24 hours. In 23.46% cases it took 5-10 hour for the magistrate inquest. In only 1 case (1.23%) it took less than five hours for magistrate inquest to commence after death.

Table 2. It is observed that in 74.39% (61 cases) of the total cases, non-availability of magistrate is main reason for delay.

Table 3. Delay in magistrate inquest is significantly related to non-availability of magistrate, ($p<0.5$). This means that if availability of magistrate is done properly than the delay in doing magistrate inquest can be minimized to a certain extent.

Graph 1. During this study it is observed that the transportation of body is made available by the hospital authorities (HO) in case of hospital admitted custody death, 39.02% cases. While, in case of deaths which occurred in prison, or at place of custody the arrangement for transportation of body to the authorized centre for autopsy is done by Police (P) in majority of the cases 42.68%. In 18.30% cases this facility is arranged privately (PR) by the help of relatives.

Table 4. This study observed manhandling of body during transport in 28.05% of cases, with most common manner of transport being by road.

Table 5. It is observed that 46.34% of body of custodial deaths were brought from places within a distance of 7 kilometres, while 53.66% cases were from distance more than 7 kilometres. During this study it is observed in total 23 cases, there is presence of evidence of some sort of manhandling. In 12 cases out of 23 cases, breaking of rigor mortis is noted. Abrasions (post-mortem in nature) over the body are noted in 06 cases out of 23 cases. Postmortem lividity is shifted, as corroborated with the history in 05 cases out of 23 cases.

Table 1: Range of time interval between death and magistrate inquest

Sr. No.	Time Interval Between Death and Magistrate Inquest(Hours)	Frequency	Percentage
1.	1 - 5 hr	1	1.23%
2.	5-10 hr	19	23.46%
3.	10-24 hr	51	62.96%
4.	>24 hr	10	12.35%
	Total	**81**	**100.00%**

Table 2: Reason for delay in doing magistrate inquest

Reason for Delay Doing Magistrate Inquest	Frequency	Percentage
Non-availability of Magistrate (NAM)	61	74.39%
Delay in transport+ NAM	18	21.95%
Wrong Inquest + NAM	3	3.66%
Total	82	100.00%

Table 3: Fischer T-Test

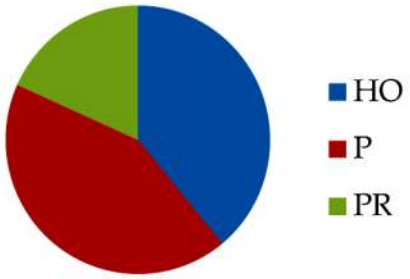
	1 Tailed P	2 Tailed P
Mid-P Exact	6.696E-07	-
Fisher Exact	1.3391E-06	2.6782E-06

Table 4: Evidence of Manhandling during transportation of body

Manhandling During Transport	Frequency	Percent
No (No)	59	71.95%
Yes (Ye)	23	28.05%
Total	**82**	**100.00%**

Table 5: Correlation between distance of transportation and manhandling

Distance of Transportation	Manhandling	
	Absent	Present
Less than Seven Kilometer (< 7 km)	38	0
More than Seven Kilometer (> 7 km)	21	23
Total	59	23



Graph 1: Arrangement for transportation of body.

Discussion

Total cases studied during this study were 82. 72 deaths were pure custodial deaths. The remaining 10 deaths were from other facilities which are directly under Magistrate / Judicial authority / power. These facilities included Orphanages, Beggar Homes, and Reformatories. 2 deaths occurred in the beggar home under the Beggar's Act, 7 cases were from the orphanages which are under State Government and 1 case from reformatory. In cases of death at above mentioned places the police usually come with Police inquest and panchnama for the autopsy, though these places are under control of State or Judiciary. But, there has been no specific mention about these places in the NHRC guidelines. These places need to be brought under the NHRC guidelines.

In 1993 National Human Rights Commission after its formation observed the rising numbers of incidents of custodial deaths and custodial rapes. The Commission in order to suppress this picture, determined to lay down directives to the District Magistrates and Superintendent of Police of every district to report about such incident within 24hrs to the Secretary General of the Commission. Failure to report promptly would give rise to presumption that there was an attempt to suppress the incident [3].

During this study it was noted that the mean time interval between the death and start of the magistrate inquest of 23.75 hours. The minimum time interval was of 3.5 hours. The maximum time interval was of 408 hours. This maximum time interval was seen in case where police inquest was done in a case of death from beggar home. This can be attributed, firstly to the wrong inquest done, secondly making the magistrate available for doing inquest and also to time passed while making a decision regarding doing magistrate inquest. In this current study it is observed that in 74.39% (61 cases) of the total cases, non-availability of magistrate is main reason for delay.

The problem which can arise from this delay since the time of death is the post-mortem changes, which keeps on increasing with the passage of time. Post-mortem changes can make it difficult for the doctor doing autopsy to misinterpret some of the findings or sometimes actual finding can get obscured due to postmortem changes. By the misinterpretation sometimes the accused in certain cases cannot be brought to justice. Bringing justice to the deceased is the aim behind doing autopsy in custodial deaths, by the NHRC. This thing can destroy the very purpose of doing autopsy in custodial deaths.

The dead body should be covered in special Body Bags having zip pouches for proper transportation. Clothing on the body of the deceased should not be removed by the police or any other person. It should be collected, examined as well as preserved and sealed by the doctor conducting the autopsy, and should be sent for further examination at the concerned forensic science laboratory [4]. In case of deaths which occurred in prison or at place of custody the arrangement for transportation of body to the authorized centre for autopsy was done by Police in majority of the cases 42.68%.

In 18.30% cases this facility was arranged privately by the help of relatives. This included the cases who died in police custody and those who died in beggar homes, which was under direct supervision of the state or of the magistrates. In all the transportation to the centre (except for hospital admitted) it was observed that there had been no cold chain preservation of the body was done.

Artefact is defined as any change or feature introduced in a body after death that is either accidentally or physiologically unrelated finding to the natural state of body. Artefacts are broadly classified under two heads (a) Introduced between death and autopsy. (b) Introduced during autopsy [5]. During this study it is observed that artefacts were introduced that at various level. The observed artefact related to loss of rigor, postmortem abrasion

was noted. There is significantly higher manhandling found if the distance of transportation is more than 7 km, with p value < 0.05. That means as the distance of transportation increases from the centre, the chances of manhandling increases.

Conclusion

Delay in information to magistrate and subsequent inquest by magistrate causes inconvenience to the relatives and also creates problems in scientific interpretation of autopsy findings. Hence, the custodians of deceased and the Magistrates doing inquest need to be made accountable for this problem. In view of this, the Revenue and Home Department of the State should bring out a Government Resolution directing Police Officers, Jail authorities and Magistrates doing inquest to avoid delay in performance of their respective role in such cases. The custodian of the deceased must immediately notify the death to the Sub-divisional Magistrate / Taluka Magistrate under intimation to District Magistrate and the authorized autopsy centre.

The dead body needs to be wrapped in a bed-sheet and transported to the autopsy centre in water-proof rexin bag, with instructions to the accompanying care-takers to restrain from undue manhandling, which causes artefacts after death. Hence, these persons must be instructed to handle the body with care and caution during transit.

It has been observed and also noted in this study that the dead bodies from Beggar

Homes and Orphanages are also brought for post-mortem examination. Government being custodian of such establishments a Government resolution specifying as to whether or not magistrate inquest and videography is necessary in such cases needs to be issued to avoid confusion, disrespect to the cadaver and subsequent delay.

Every District Police Head Quarter / District Hospital should have a hearses van with cold storing facility which will help in avoiding the decomposition changes during transit.

Conflict of Interest: None

Funding: None

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Original Article

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Histochemical Characters of Prostatic Intraepithelial Neoplasia

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Abstract

Benign Prostatic hyperplasia (BPH) and carcinoma prostate are increasingly frequent with advancing age. Prostatic intraepithelial neoplasia (PIN) is the most established precursor of prostatic carcinoma. HGPIN and prostate cancer share genetic and molecular markers as well, with PIN representing an intermediate stage between benign epithelium and invasive malignant carcinoma. The clinical significance of HGPIN is that it identifies patients at risk for malignancy. Purpose of this study was to find out the incidence of prostatic intraepithelial neoplasia (PIN) and to study the histochemical characters of PIN and prostatic adenocarcinoma. *Method:* The present study included prostatic tissue specimen of 150 cases received in the pathology Department during period of April 2013 to December 2014. Histopathological evaluation of all cases were done in the department. *Results:* PIN accounted for 8.6% (13 cases) with a peak incidence in age group of 70-79 years. LGPIN accounted for 8% (12 cases) and HGPIN accounted for 0.6% (1 case).

Keywords: Benign Prostatic Hyperplasia; Prostatic Intraepithelial Neoplasia (PIN).

Introduction

Prostate is essential structure of the male reproductive system composed of glands and stroma and its secretions forming 30 - 50 % of the seminal fluid volume [1].

With increasing life expectancy, increasing awareness and better health services lesions of prostate has become a common specimen received for diagnostic of both benign and malignant lesions. Most patients of benign lesions present with complaints related to micturition and incontinence.

Carcinoma prostate is an important health problem of elderly male population, and pose a challenge to urologists, radiologists and pathologists [1].

Currently, many men are identified as having early prostate cancer through the use of prostate specific antigen screening [2,3]. Carcinoma of the prostate is the most common malignant tumor in men over the age of 65years [4]. Carcinoma prostate is the most frequently diagnosed cancer in men next to carcinoma lung and according to national cancer registries in India it is the second leading site of cancer [5,6]. There is parallel rise in incidence with advancing age of BPH and prostate carcinoma [7].

Benign prostatic hyperplasia (BPH) is a common urological condition in men. The prevalence of BPH increases from 20% at 40 years of age to 90% by the eighth decade of life [8]. Prostatic carcinoma is globally the second most frequently diagnosed cancer and the sixth leading cause of cancer death in males [9]. In India, it constitutes about 5% of all male cancers [10]. Prostate-specific antigen (PSA), digital rectal examination, and transrectal ultrasound are the tools most commonly used to screen for prostate cancer. However, biopsy remains the gold standard for final diagnosis. Histological diagnosis of prostatic cancer is usually based on morphological features such as growth pattern, nuclear atypia, and absence of basal cells.

Although nodular hyperplasia can almost be considered as an aging process, the histological variations like different types of hyperplasia, low

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grade prostatic intraepithelial neoplasia (LGPIN) and high grade prostatic intraepithelial neoplasia (HGPIN) merits discussion.

Hence purpose of this study was to find out the incidence of prostatic intraepithelial neoplasia (PIN) and to study the histochemical characters of PIN and prostatic adenocarcinoma.

Method

The present study included prostatic tissue specimen received in the pathology Department during period of April 2013 to December 2014. The sample size was 150 cases with prostatic lesion. Brief clinical data were noted from the case records, which included the age presenting symptoms, digital rectal examination findings, and clinical diagnosis. The specimens thus obtained were fixed in 10% formalin. Prostate glands were examined grossly for dimensions and any other gross abnormality on external surface. In case of TURP, approximately 5gm of tissue was processed in one cassette and embedded. The entire tissue was processed in case of prostectomy representative bits were processed. Then section 4 to 6 microns thick were prepared. These were stained routinely with hematoxylin and eosin.

Other special stains like Alcian blue pH 1 , periodic acid Schiff (PAS) and Ziehl Neelson were performed wherever necessary. The procedure followed for tissue processing and staining technique are those given in "Cellular Pathology technique" by CFA culling. All the lesions were graded in to non neoplastic and neoplastic lesions. The cases of prostatic adenocarcinoma were graded using Gleason microscopic grading. The clinical and histological data so obtained were analyzed and compared with another similar studies.

Results

The adjacent tissue in these cases showed adenofibromyomatous hyperplasia in 10 cases, HGPIN in 6 cases and inflammation in 3 cases.

Table 1: Prostatic intraepithelial neoplasia cases studied

Lesions	No. of Cases
LGPIN with BPH	12
HGPIN with BPH	1
HGPIN with carcinoma	6

Table 2: Histopathological diagnosis in the cases studied

NH	
Without Prostatitis	98(65.3%)
With Prostatitis	25(16.6%)
PIN	
LGPIN	12(8.0%)
HGPIN	1 (0.7)
Adenocarcinoma	12(8%)
Metastatic TCC (from Urinary Bladder)	1(0.7%)
Squamous Cell Carcinoma	1(0.7%)

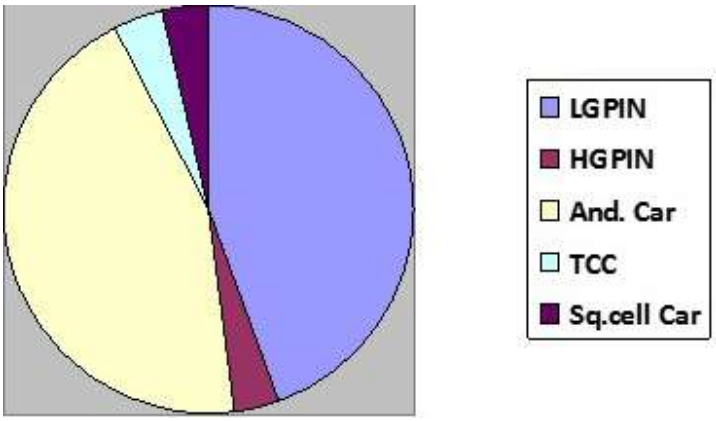

Fig. 1: Final histopathological diagnosis in the cases studied

Table 3: Microscopic findings in malignant lesions studied

Adjacent Prostatic Tissue	
Adenofibromyomatous hyperplasia	10
Inflammation	3
HGPIN	6

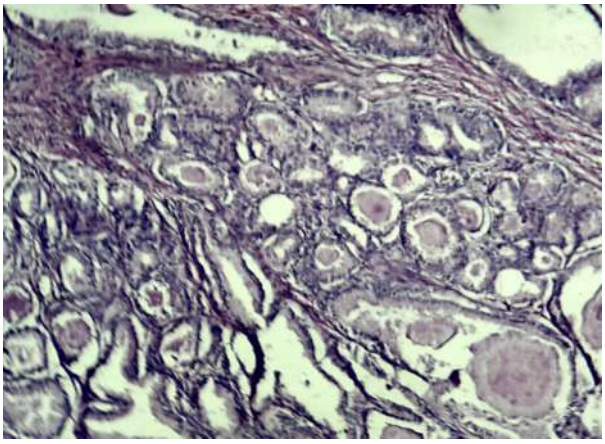

Fig. 2: Low grade Prostatic intraepithelial neoplasia (10x)

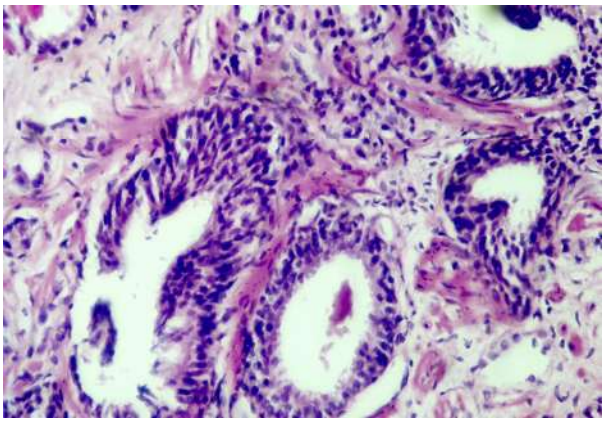

Fig. 3: High grade prosthetic intra epithelial neoplasia (45x)

Discussion

In the present study out of 150 specimens examined 19 cases showed PIN, 12 cases LGPIN which was associated with NH and 7 cases showed HGPIN out of which 1 was associated with NH and the rest 6 were associated with prostatic carcinoma.

LGPIN was characterized by epithelial crowding and stratification with anisonucleosis but no prominent nucleoli was observed.

HGPIN was characterized by pronounced epithelial crowding and stratification nuclear enlargement hyperchromasia with prominent nucleoli. None of these lesions showed disruption of basal cell layer and basement membrane .

In our study PIN was seen most commonly in the age group of 70 –79 yrs. In the study by McNeal and Bostwick frequency of PIN was highest in the age group 60 –69yrs [11]. In the study by Lee et al, the mean age of PIN was 65 yrs.

In our study out of 19 cases of PIN, 13 cases were associated with BPH out of which 12 were LGPIN and 1 was HGPIN. Out of 12 case of adenocarcinoma 6 showed HGPIN in the adjacent prostatic tissue.

Brawer concluded in his study that PIN occurred more commonly in prostates with invasive carcinoma than in without. According to his study PIN was found in 73% of prostates with carcinoma and 32% of prostates without carcinoma [13].

The incidence of PIN varies considerably in different studies probably because histological diagnosis of LGPIN shows subjective variation and many studies do not report LGPIN [12]. The incidence of HGPIN is relatively low in cases of prostatic carcinoma because most of the specimens were TURP which does not have enough material compared to radical prostatectomy which was studied in other studies [13]. It has also been suggested that transition zone carcinoma might not be associated with HGPIN [14]. Moreover incidence of isolated HGPIN is uncommon in TURP specimens (prevalence 2.3%) [15]. This is because the site of HGPIN is common in the peripheral zone as compared to transition zone.

Prostatic Carcinoma

In the present study peak incidence of both PIN and prostatic carcinoma was seen in age group of 70-79 yrs. It has been observed that PIN occur at least a decade earlier compared to prostatic carcinoma. But in present study no such age difference was noted.

Many recent studies show a higher incidence of prostatic carcinoma in the age group of 61-70 yrs. However in studies of Moore and Baron the peak incidence was seen in age group of 51-60 yrs. This may indicate change in trend of prostatic carcinoma.

Conclusion

PIN accounted for 8.6% (13 cases) with a peak incidence in age group of 70-79 years. LGPIN accounted for 8% (12 cases) and HGPIN accounted

for 0.6% (1 case). LGPIN were reported in view of complete description of histologic variants. Incidence of isolated HGPIN was low because most of the specimens studied included TURP, which is from transition zone, and HGPIN is common in peripheral zone. However HGPIN was noted in adjacent prostatic tissue in 6 cases (50%) of prostatic adenocarcinoma out of 12 cases of adenocarcinoma.

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Original Article

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Cytological Assessment of Barr Bodies in Buccal Mucosal Smears and Peripheral Smear in Sex Determination

Karra Shilpa[1], Gayathri M.N.[2], Monica G.S.[3]

Abstract

Introduction: Barr body has been recognized as the cytological manifestation of the inactive X chromosome in interphase nuclei in a highly condensed state. *Aims and Objectives*: To assess the efficacy of sex determination between pap stained buccal mucosal scrapes and leishman stained drumstick appearance in peripheral smear. *Material and Methods*: Buccal mucosal smears and peripheral smears are collected from 100 individuals who visit K. R. hospital and Cheluvamba hospital of age ranging from 20-30 years. The buccal mucosal scrapes were stained with papanicolaou stain and peripheral smear of the same individual were stained with leishman stain. *Results*: In females and males drumstick appearance was more compared to barr body. *Conclusion*: Sex determination using buccal scrapes and peripheral smear stained with papanicolaou stain and leishman stain proved to be simple, accurate and cost effective method in our study.

Keywords: Barr Body; Drumstick; Papanicolaou Stain; Leishman Stain.

Introduction

Establishing the identity of an individual is of utmost importance in forensic science and sex determination is one of the first steps in identification of an individual in the field of forensic science and in athletes [1]. Some individuals have mosaicism, meaning that some of their cells are XX while others are XY. Depending on the proportion of the cells that are XX, the individual may appear phenotypically female. Sexual ambiguity has created difficulties in the area of sports for many years [2]. Sex determination or estimation by observation of the presence of barr body is a relatively simple, inexpensive technique that yields immediate results [3,4].Barr body has long been recognized as the cytological manifestation of the inactive X chromosome in interphase nuclei [5,6]. Barr body test is a test to determine the presence of multiple X chromosome that present in acell, only one X is allowed to remain active and any excess X chromosomes are randomly inactivated and condensed. These inactivated X chromosome are present adjacent to the nuclear membrane and is called barr body. The term sex chromatin in blood refers to the drumstick appearance of polymorphonuclear leukocytes or Davidson bodies. These drumstick appendages are found on 0.5% to 2.6% of neutrophils [7]. Demonstration of sex chromatin forms an important aspect of human genetics. It also establishes the interrelationship between sex chromatin and an inactive X-chromosome.

Aims and Objectives

To assess the efficacy of sex determination between pap stained buccal mucosal smears and leishman stained drumstick appearance in peripheral smear.

Materials and Methods

Buccal mucosal smears and peripheral smears are collected from 100 individuals who visit K.R. Hospital and Cheluvamba Hospital (50 males and

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50 females). Their age ranging from 20-30 years.

Method of Collection of Data

Consent is taken from the subjects and are asked to rinse their mouth with water. After this the buccal mucosa is scraped using a wooden spatula. The first scraping is discarded to avoid mucous and debris. The consecutive mucosal scrapes will be done by applying gentle and firm pressure to collect the mucosal cells. The collected scraping is then transferred onto clean slides and smears are made and examined under light microscope. A total of 100 cells per slide are counted for the presence of Barr bodies, under 100x magnification which appears as semidisc or triangle with flat side against the nuclear membrane. Doubtful cells areconsidered negative. The count of morphologically acceptable Barr bodies is expressed as percentage.

Tables showing the frequency of Barr body and Drumstick in both the sex

Table 1: Females

Sl. No	Study Findings	No of Cases	Percentage
1.	Increased barr body	08	16
2.	Increased drumstick appearance	30	60
3.	Both equal	12	24

Table 2: Males

Sl. No.	Study Findings	No of Cases	Percentage
1.	Increased BARR body	06	12
2.	Increased drumstick appearance	22	44
3.	Both equal	22	44

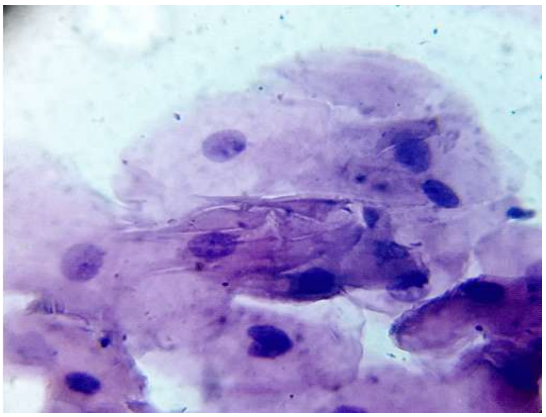

Fig. 1: Barr body appearance in buccal scrape

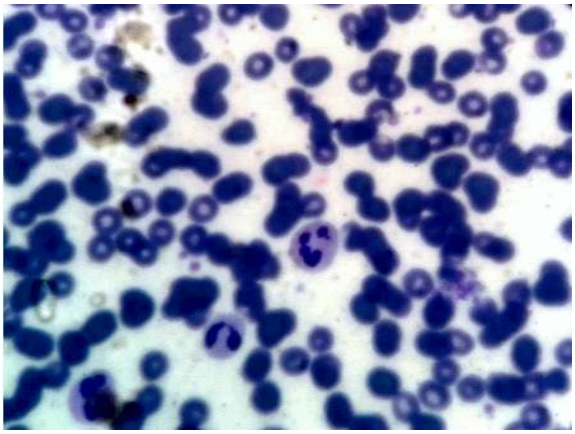

Fig. 2: Drumstick in peripheral smear

The peripheral smear of the subjects will be studied simultaneously for drumstick appearance of the neutrophils under 100x magnification.

The slides are analysed without referring to the recorded clinical data. Subjects with a chromatin count < 5% are recorded as male and those with > 5% are recorded as female. The sex as determined by microscopy will be compared with known sex of the subjects.

Inclusion Criteria

Subjects with age ranging between 20-30 years are included in the study.

Exclusion Criteria

Slides containing mucosal debris and bacterial contamination are excluded in this study.

Ethical clearance has been obtained from the institution.

Results

A total of 100 cases were analysed and the age of both the study groups ranged from 20-30 years with

50 cases of male and female each. In the present study we observed in femalesbarr body accounting to 5% - 16% and drumstick 3%-16%, where as in male it was 0% - 4% and 0%- 6% respectively. Also observed that in females highest number of barr bodies is found in 8 cases and increased number of drumstick appearance in neutrophils in 30 cases. Barr body and drumstick appearance in neutrophils are equal in 12 cases. In male subjects barr body is more in 6 cases and drumstick appearance in neutrophils is more in 22 cases and both equal in 22 cases as shown in the tables.

Discussion

Since the discovery of barr bodies, it has been employed in nuclear sexing to differentiate between female and male cells. The mean percentage of barr bodies in an individual varies not only with the sex of the person [8,9,10,11] but also as a function of ethnicity [8,10], age [12,13] and in females the phase of menstrual cycle [14]. The frequency of these sex chromatids is aberrant in patients suffering from Down's syndrome, klienfielter's and other chromosomal abnormalities [15]. In our study, only those barr bodies which were attached to the nuclear membrane were included. It is necessary to exert firm pressure to secure suitable cells for patches of cells with different types of nuclei occur. The patches are apparently derived from three different epithelial strata.

1. The superficial layer contains pyknotic degenerating nuclei which are often contaminated by bacteria.
2. The intermediate layer provides nuclei suitable for sexing. These have a smooth nuclear membrane and finely granular nucleoplasm in which the sex–chromatin body, if present is deeply stained.
3. The deep layer has nuclei with prophasic chromosomes nd prominent nucleoli. Squashing of the nuclies with subsequent enlargement, permits study of its fine structure. Regardless of the obscure nature of the very early embryological events as observed in pseudohermaphroditism can be diagnosed with sex chromatin pattern and analysis of leukocytes metaphase chromosomes. The mean percentage ofbarr bodies were consistently higher in females than in males, which is concordance with other studies Manjula BhaiK Hetal, Mittal Tetal, and Aggrawal NK etal. Leukocytic drumsticks are stalked, rounded chromatinappendages, 1.5 microns in diameter, projecting from the neutrophilic nuclei of female subjects only and are found to be more in females than in males in our study.

Conclusion

Sex determination using barr bodies in buccal scrapes is a simple method providing 100% accuracy; this makes it a significant accessory to other methods of sex determination. Identification of drumstick in peripheral smear is easier which don't need any expertisation. Papaniculou stain method is recommended for rapid nuclear sexing which helps in screening oligophrenic subjects at the primary health care units for early diagnosis of sexual ambigutity which is needed in the field of sports. Because of the simplicity of the procedure and coast effectivity this method can be adopted.

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Profile of Suicide by Burn in Jharkhand: an Autopsy Based Study

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Abstract

Background: Self intentionalviolent acts are one of the important causes of death nowadays. Burning is one of the modes of committing suicide, although it is painful and non-instantaneous death as compared to others modes of suicide. Since limited data is available on suicidal burn in this part of India i.e. Ranchi, Jharkhand. Therefore, we have planned this study to know the profile and attributing factors for suicidal burn in the state of Jharkhand of India. *Materials & Methods:* This prospective study which was carried out on 162 cases of death due to burns in the department of forensic medicine & toxicology of Rajendra Institute of Medical sciences, Ranchi during from 15th April, 2012 to 14th October, 2013. Information regarding the socio-demographic, mode of suicides, time of incidence, place of incidence, occupation, etc were gathered from the police papers like inquest report, dead body challan etc, and through detailed interviews of the relatives, neighbors, friends, and police officials accompanying the dead bodies. *Results:* Hindu married females belonging to rural backgroundbetween ages15 years to 44 years were most common victims of suicidal burns. Most of the suicidal burns occurred during summer season (61%) followed by winter (Dec-March) (17%). Majority (56%) were chose In Law's home followed by parental home (44%). The maximum suicidal burns incidence occurred at evening (between 4 PM to 8 PM), which accounts 33% followed by late night (between 12 AM to 4 AM) with 22%. *Conclusion:* The present study has findings more or lessconsistent with the findings of the other studies conducted in Indian.

Keyword: Suicidal Burn; Seasonal Variations; Place of Incidence.

Introduction

Suicide is one of the leading causes of death in the World. Approximately one million people commit suicide each year, or about one life lost every 40 seconds [1]. The World Health Organization (WHO) estimates that of the nearly 900,000 people who die from suicide globally every year, 170,000 were from India [2]. Suicide rates in the world, mainly in developing countries, in the past fifty years have increased about 60%. A significant amount of suicides occur in Asia, which includes about 60% of suicides. Based on WHO reports, China, India and Japan were included in approximately 40% of all world suicides [3]. Suicide by burning was a rare condition in the developed countries (0.06-1% of all suicides) but was more frequent in the developing countries (accounting for as many as 40.3% of all suicides). Burns were the fourth most common type of trauma worldwide, following a road traffic mishaps, falls, and violence among people. A majority of incidences of burns occur in countries or regions which lack the basic infrastructure and setup to reduce the incidence and severity of burns [5].

In India, burn injury was one of the major causes of death, specifically in females. The problem ofburns in developing countries like India was more as a result of different and varied socio-cultural factors present in the Epidemiology of Burn Deaths in Jharkhand, India. Some of these factors may be poor housing conditions, inadequate maintenance of

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electric appliances, dowry, poor literacy, poverty and ignorance. The exact assessment of the incidence of burns was not easy due to overpopulation and less reporting. The loads of ever expanding population, poor literacy, lower socioeconomic status, insufficient safety standards at home and in industry, corruption etc. have caused a significant increase in cases of burns [6].

Effective suicide prevention requires good studies on the use of suicide methods and attributing various others factors in different countries. Suicide was often committed out of despair, or attributed to some underlying mental disorder, which includes depression, bipolar disorder, schizophrenia, alcoholism and drug abuse [7]. Financial difficulties, troubles with interpersonal relationships and other undesirable situations play also significant role [8].

According to International Association for Suicide Prevention, Suicide is nevertheless a private and personal act and a wide disparity exists in the rates of suicide across different countries. A greater understanding of region-specific factors related to suicide would enable prevention strategies to be more culturally sensitive [9].

As per data available with National Crime Report Bureau (NCRB) Government of India [10] that there were few studies conducted in India. Such study has not been conducted in this part of India i.e. Ranchi, Jharkhand. Therefore, we have planned this study to assess various epidemiological factors related to deaths due tosuicidal burnsin the state of Jharkhand of India. The result of study may be help to plan strategies to prevent such mortality and morbidity due to suicidalburnsin this part of country.

Materials and Methods

This prospective study was carried out in the Department of Forensic Medicine & Toxicology, Rajendra Institute of Medical Sciences (RIMS), Ranchi for a period of one and half year from April, 2012 to October, 2013. The materials for the present study were cadavers brought for medico legal autopsy from various police stations of Ranchi District (Jharkhand) at the Forensic Medicine and Toxicology Department of RIMS, Ranchi. During the study period total 3492 cases were autopsied, out of which only 162 cases were suicidal burns in nature. These 162 cases of burns were screened on the basis of information provided by the relatives, neighbours, friends, and police officials accompanying the dead bodies and finding present on the bodies. Furtherinformation regarding the socio-demographic, mode of suicides, time of incidence, place of incidence, occupation, etc were gathered from the police papers like inquest report, dead body challan etc, and through detailed interviews of the relatives, neighbours, friends, and police officials accompanying the dead bodies. In case of hospital deaths, hospital papers were also examined. To calculate the seasonal variation the seasons were classified according to the Indian Meteorological Department (IMD) [11] which designated four climatological seasons in India were as: Winter, occurring from December to March, Summer or pre-monsoon season from April to June, Monsoon or rainy season from July to September and Post-monsoon or autumn season from October to November.

Collected data were entered in to SPSS version 10 and were analyzed and results were presented in the form of table and figures.

Results

This study was an attempt to analyse the demographic profile of suicidal deaths due to burn in this part of the country. To achieve the goal of study a 162 cases of suicidal burns deaths were screened and analysed. This comprised 4.64% of the total post-mortem conducted in the department during the study period.

Amongst total 162 cases of suicidal burns, 63 (39%) were male and 99 (61%) were female. It was found that the femalesvictims outnumbering the males.

It was observed from Table 3 in which the cases were distributed on the basis of their religions and it is observed that the majority of victims were Hindus (72 %) followed by Muslim (22 %) and Christians (6%) and.

Age-wise profile of victims showed that the majority (89.0%) of victims who had committed suicides by burn were in the age-group 15-44 years. Among them, majority (91; 78%) were females and 53 (22%) were males. While in the age of less than 15 years the males outnumbering the females (Table 1).

Social Status of Suicidal Burn Victims

Social Status of victims was classified in various categories on the basis of marital status, Economic and Educational status. The information on the social status of suicide victims was presented in Table 2. It observed that 78% of the suicide victims were married while 16% were unmarried. Widows

and Divorcees have accounted for 6%. Out of married victims, majority 63.08% victims were female while the rest 24.61% were male.

As it was depicted in the Table 3, the maximum cases (67%) were from a rural area followed by sub-urban (22%). The distribution of cases according to economical status the majority (78.0%) of suicidal burn victims were belonged to middle economic class followed by lower economic class (23%). The maximum burn victims (79.0%) were Illiterate and majority (73%) of cases were from Hindu religion, followed by Muslim (22%) and Christian religion (6%). Furthermore, the cases were distributed according to place of incidence and it was observed that majority (56%) were chose In Law's House followed by parental house (44%) (Table 3).

The seasonal variations in cases are depicted in Table 4. Most of the suicidal burn occurred during summer season (61%) among the summer the maximum in the month of April and May with 28% each. This is followed by winter (Dec-Feb) season (16.7%).

Table 1: Distribution of victims of suicidal burn in relation to Age and Gender

Age Group (in years)	Gender				Total	
	Male		Female			
	Frequency	%	Frequency	%	Frequency	%
0-14	06	06.3	5	5	9	05.6
15-29	23	36.6	40	40	63	39
30-44	30	47.7	51	52	81	50
45-59	00	0.1	0	0	0	0
>60	6	9.5	3	3	9	5.6
	63	39	99	61	162	100

Table 2: Distribution of victims of suicidal Burn in relation to Nuptial and Gender

	Marital Status		Male		Female	
	Frequency	%	Frequency	%	Frequency	%
Married	127	78	49	38.6	78	61.4
Unmarried	26	16	14	53.8	12	46.1
Widow	9	6	00	00	09	100
Total	162	100	63	39	99	61

Table 3: Distribution of Cases of Suicidal Burn

Variables	Co Variables		
Habitats wise distribution	Urban	Sub-urban	Rural
	18 (11%)	36 (22%)	108 (67%)
Socioeconomic Status wise distribution	High	Middle	Lower
	02 (1%)	126 (78%)	36 (23%)
Educational Status wise distribution	Literate	Illiterate	
	34 (21%)	128 (79%)	
Religion wise distribution	Hindu	Muslim	Christian
	117 (73%)	36 (22%)	09 (06%)
Marital Status wise distribution	Married	Unmarried	Widows
	127 (78%)	26 (16%)	09 (06%)
Place of Incidence wise Distribution	In Law's House	Parent House	Rental House
	90 (56%)	72 (44%)	00 (00%)

Table 4: Distribution of Victims of Suicidal Burn according to Season of Incidence

Seasons	Frequency	%
Winter (December - Fab)	18	16.7
Summer (Pre Monsson) (March - May)	66	61
Rainy (Monsson) (June – August)	12	11.1
Post-monsoon(September - November)	12	11.1

Discussion

Each suicide is a personal tragedy that prematurely takes the life of an individual and has a continuing ripple effect, dramatically affecting the lives of families, friends and communities. Every year, more than 1,00,000 people commit suicide in India. There were various causes of suicides like professional/

career problems, discrimination, sense of isolation, abuse, violence, family problems, mental disorders, addiction to alcohol, financial loss, chronic pain etc. NCRB collects data on suicides from police recorded suicides cases [12]. The numbers of suicides in the country during the decade (2005–2015) have recorded an increase of 17.3%. The increase in frequency of suicides was reported each year till 2011 thereafter a declining trend has been noticed till 2014 and it again increased by 1.5% in 2015 over 2014. The population has increased by 14.2% during the decade while the rate of suicides has slightly increased by 2.9% (from 10.3 in 2005 to 10.6 in 2015). The rate of suicides was showing a mixed trend during the decade (2005-2015), however, rate of suicides was showing declining trend since 2010 [12].

Causes of Suicides

Family Problems and Illness were the major causes of suicides which accounted for 27.6% and 15.8% of total suicides respectively during 2015. 'Marriage Related Issues' (4.8%), 'Bankruptcy' & 'Love Affairs' (3.3% each), 'Drug Abuse/Alcoholic Addiction' (2.7%) and 'Failure in Examination' & 'Unemployment' (2.0% each), 'Property Dispute' (1.9%), Poverty (1.3%) and Professional/Career Problem (1.2%) were other causes of suicides [12].

There were different methods and means of committing suicides. The use of fire for suicide was uncommon but not rare, but it was described as low incidence compared to other means [13]. The use of fire was among the most traumatic of all forms of suicide and has a strong cultural significance and political impact in several countries. There were references to self-injury associated with different beliefs, such as the Sati ritual in India, where widows threw themselves on the funeral pyres of their dead husbands. In more modern times, the main motivations for self-immolation were personal or family matters [14]. Gender and geographical distribution influence suicide methods. In India, most suicides were committed by young and married women, with the use of gasoline [12]. This was similar in Iran [15,16], Cairo [17] and in other Asian populations [18]. The overall male: female ratio of suicide victims for the year 2015 was 68.5:31.5, showing a marginal increase of male and marginal decrease of female ratio as compared to year 2014 (67.7:32.3). The proportion of Boys: Girls suicide victims (below 14 years of age) were 53.8:46.2 in 2015 as compared to 52.3:47.7 in 2014. The proportion of female victims were more in 'Marriage Related Issues' like 'Dowry Related Issues', 'Divorce', 'Physical Abuse (Rape)'. Middle aged people (30 and above-below 45 years) and Youth (18 and above- below 30 years) were the most vulnerable groups resorting to suicides. These age groups accounted for 33.4% and 32.8% suicides respectively [12].

In this study, most individuals who committed suicide by burning (85%) were between the ages of 15 and 44 years, similar to other reposts [19,20,21]. These findings were perfectly understandable, since people in this age often incur different risk situations (at work, social environment and marriage) that may cause distress or an unexpected response. The influencing factors for this distribution were unemployment, failure in love, marital disharmony, financial problems, dowry harassment etc. The suicides were a path to find a way out of these situations.

Social Status of Suicide Victims

Social Status of victims was classified in various categories on the basis of marital status, Economic and Educational status. The information on the social status of suicide victims was presented in Table 3. It observed that 78% of the suicide victims were married while 16% were un-married. Widows and Divorcees have accounted for 6%. Similar observation was reported by NCRB [12], that the about 69.5% of the suicide victims were married while 21.1% were un-married.

The distribution of cases of burn according to marital status showed that the incidences in married people were higher as compared to unmarried people. Out of married cases, 63.08% victims were female while the rest 24.61% were male. Similar findings with ratio of female predominance were reported by Gupta RK and Srivastava AK [22], BatraAK [23], AmbadeVNetal [24], Mangal HM et al [25], Zanjad NP et al [26] and Dasari H et al [27]. It could be due to social and family related problems observed more in married persons especially in females. Specifically among married females those were victims of the heinous crime of dowry as practiced in India.

Economic Status of Victims

The information on the economic status of suicide victims was presented in Table 3. Majority (78.0%) of suicidal burn victims were belonged to middle economic class. The findings of the present study have consistency with the findings reported by different authors on the same problems like Gupta M et al [28], Jayaraman V et al [29], Subrahmanyam M [30], BR Sharma et al [31], and Haralkar SJ etal [32] and Tasgaonkar V G, et al [21]. This could be due to

unemployment, partial or total dependence on husband on parents, poor education and dowry system lead to low socioeconomic status and poor standards of living.

Educational Status of Victims

The education-wise breakup of suicidal burn victims was presented in Table 3. The maximum numbers of victims (79.0%) were Illiterate.This finding was consistent with M. K. Doibale [33], Jayaraman V et al [26] and Attia AF etal [34]. Education attributes to more awareness, responsible behaviour, more knowledge and practice of safety measures. Hence incidence of burns among illiterates was found to be maximum than educated.

Habitat wise Distribution

In the present study, maximum 108 cases (67%) were from a rural area. Similar findings were reported by different authors those conducted similar studies in different parts of the country like Batra AK [23], Zanjad NP et al [26], Dasari H et al [27]and Tasgaonkar V G, et al [21]. While Chawla R et al [35] and Singh D etal [36] reported majority from urban. The reason for the increased incidence of burn cases among rural population in the present study may be due to our Medical Institution and Hospital acts as a referral centre for nearby vast rural population attached to it and therefore all the medico–legal post-mortems conducted on burn cases in our autopsy centre, which were referred to this institute were higher.

Religion wise Distribution

The results of present study revealed that maximum number (73%) of cases were from Hindu religion, followed by Muslim (22%) and Christian religion (6%). This finding was consistent with Gupta RK and Srivastava AK [22], Pandey A [37], and Mohanty MK et al [38].

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Original Article

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Descriptive Study of the Haematological Parameters with Special Reference to Eosinophil Count among School Going Children

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Abstract

Parasitic infections and allergies are the major contributing factors of eosinophilia. *Aims and Objectives:* To study the various haematological parameters of school going children and to find out the correlations between the haematological parameters. *Materials and Methods:* The study was carried out on 130 students of a secondary public school of rural area of Nashik district. The haematological samples were processed on fully automated 5-part haematology cell analyzer. Eosiniphilia was divided into: mild: 351-1500/mm3 of blood, moderate: 1500-5000/mm3 of blood, severe: >5000/mm3 of blood. Statistical analysis of the various haematological parameters was done subsequently. *Results:* Eosinophilia was present in 45.38% of children. Total leucocyte count (White blood cell count/ WBC/TLC) was normal in 95.38% children. Mild to moderate anaemia was seen in 66.9% children. *Conclusion:* Eosinophilia is common among the school going children in our study.

Keywords: Eosinophilia; Haematological Parameters; Children.

Introduction

The values of hematological parameters are affected by a number of factors even in apparently healthy populations [1]. It has been shown in several studies that some of the hematological parameters exhibit considerable variations at different periods of life. At birth, the total hemoglobin (Hb) level, red blood cell (RBC) count and packed cell volume (PCV) are shown to be higher than at any other period of life [2,3]. The levels of these parameters then decrease during the next few months after birth, some more steeply than others, with the cells becoming hypochromic with the development of "physiologic" iron deficiency anemia [4,5]. The hemoglobin content and the red cells then gradually rise to adult levels by the age of puberty [5,7]. The common childhood hematologic conditions are: iron deficiency anemia of infection, transient erythroblastopenia of childhood (TEC) immune thrombocytopenic purpura (ITP) benign neutropenia of childhood , minor transfusion reactions [8].

Eosinophils are terminally differentiated granulocytes that play a role in innate host defense against pathogens, particularly parasites and viruses. Eosinophils contain highly charged proteins in their granules, mediating toxicity toward pathogens and tissues and produce a variety of inflammatory proteins which further contribute to tissue pathology. Eosinophil accumulation in the airways in severe asthma correlate with markers of local tissue and extracellular matrix (ECM) remodeling. Eosinophilia is a marker of severe asthma and those at risk for more frequent exacerbations [9].

Parasitic infections are the most common cause of eosinophilia worldwide, although eosinophilia in the population of the United States is most often due to allergies [10]. Persistent significant eosinophilia should be regarded pathological and detailed investigations should be carried out to uncover a treatable cause. Mild or moderate increase in blood eosinophil counts detected from differential leucocyte counts may be encountered during routine health screening as an isolated laboratory abnormality without an apparent association with the disease or as an epiphenomenon during a diagnostic work up

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for an illness. Normal eosinophil count in the human blood varies from 0-350/ mm3 of the blood.This amounts to about 1-3% of the differential leukocyte count. According to Marc. E. Rothenberg classification eosinophilia is divided into mild: 351-1500/mm3 of blood, moderate: 1500-5000/mm3 of blood, severe: >5000/mm3 of blood [11].

Aims and Objectives

To study the various haematological parameters of school going children and to find out the co-relations between the haematological parameters.

Materials and Methods

A cross-sectional study was carried out among children of a secondary public school of rural area of Nashik district. The sample size was 130. Subjects who were on any kind of hematinic therapy or any other drugs were excluded from the study. Subjects having any known haematological disorder or having any known causes of eosinophilia like allergy, asthma etc. were also excluded from the study. Under all aseptic conditions, 2ml of venous blood was drawn in an ethylene diamine tetra-acidic acid (EDTA) vacutainer from each subject. Analysis of the blood on a 5- part automated cell counter analyzer was carried out. Subsequently, thin blood smears were prepared. The peripheral blood smears were stained with Leishman's stain.

Manual examination under a light microscope under high power (40x) and oil immersion (100x) lenses for red blood cell morphology, presence or absence of abnormal red blood cells, white blood cell differential count and abnormal morphology if present, and manual platelet count and morphology was done. The findings were recorded according to a pre-designed proforma.

This study was a part of school health camp conducted by a medical college, the consent for the blood collection and test was given by the Principal. Phlebotomy is a simple, safe and routinely performed procedure and poses practically no risk to the subjects.

Observation & Results

The study participants were of a secondary public school of a rural area in Nashik district. Sample size of 130 subjects was taken. Mean age group was 12years among which 80% were male and 20% were female. 66.8% children, mild to moderate anaemia was seen.

TLC was normal in 95.38% children. RBCs count was less than $4.5\times10^6/\mu L$ in 36.15% children. (Table 1& 2).

Table 1:

Haematological Parameters[12]	No.	%
Hb (gm%)		
<8	1	0.7
8 - 10	2	1.5
10 - 12	84	64.6
>12	43	33.07
WBC (/μL)		
<4,000	0	0
4500 - 11000	124	95.38
> 11000	6	4.61
RBC (10^6 / μL)		
< 4.5	47	36.15
4.5 - 5.3	61	46.92
> 5.3	22	16.92
Platelets (10^3/μL)		
< 150	0	0
150 - 450	125	96.15
> 450	5	3.84
MCV (fl)		
< 83	81	62.3
83 - 101	49	37.69
> 101	0	0.76
MCH (pg)		
< 27	88	67.69
27 - 32	41	31.53
> 32	1	0.76

Table 2:

Haematological Parameter	Mean Count	SD
Hb	11.64	0.98
WBC	7682.31	1765.89
RBC	4.72	0.51
Platelets	318.7	69.52
MCV	78.68	8.44
MCH	26.86	22.25

Table 3: Differential WBC counts

DLC	Mean Count	SD
Neutrophils	57.92	7.46
Lymphocytes	38.13	7.28
Monocytes	1.07	0.76
Eosinophils	2.84	3.03
Basophils	0	0

Table 4: According to Mark E Rothenburg's Classification

Eosinophil Count	No.	%
0 - 350	71	54.61
351 - 1500	59	45.38
1501 - 5000	0	0
>5000	0	0

Table 5: Co-relation co-efficient between various Haematological Parameters

Haematological Parameters	Pearson's Co-relation Co-efficient 'r'
Hb & MCV	0.55
Eosinophil & WBC	0.44

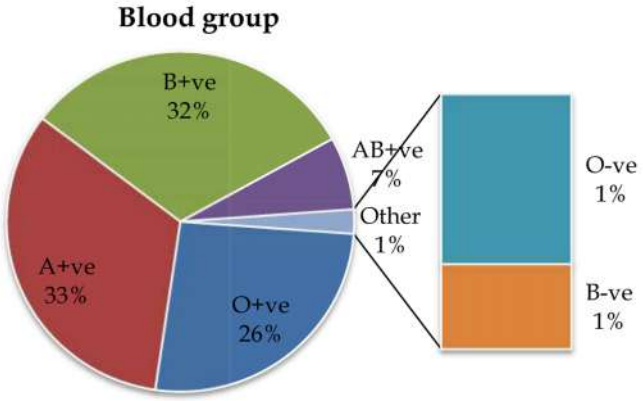

Fig. 1:

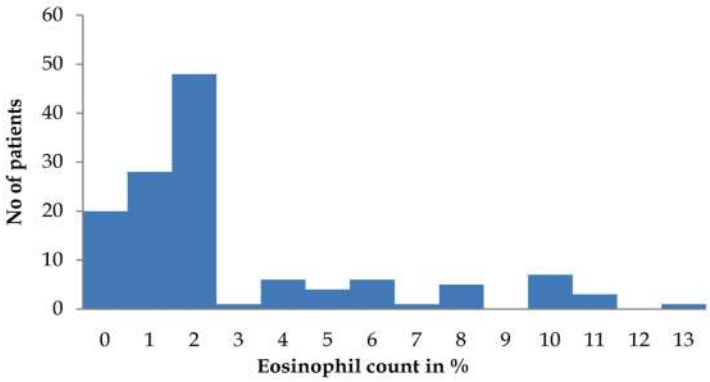

Fig. 2: Eosinophil counts

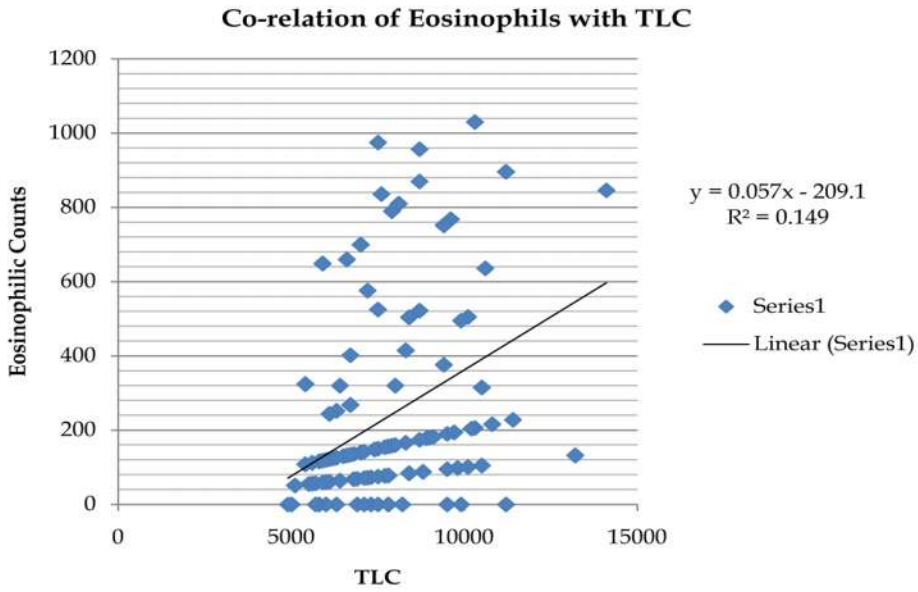

Fig. 3:

Eosinophilia was present in 45.38% children. (Table 3).

Eosinophilia was classified as Mild, Moderate and Severe on the basis of Mark E Rothenburg's classification (Table 4). Only cases of mild eosinophilia were noted which constituted 45.38% of the total subjects studied. No case of moderate / severe eosinophilia was seen.

Eosinophil counts with TLC showed an intermediate positive co-relation. Since Study participants were having either normal heamoglobin or microcytic anemia, hence the present study found the positive co-relation with Hb & MCV (Table 5).

Discussion

Intestinal parasitic infections constitute one of the major health problems in the world. Eosinophilia can arise from an extensive number of medical conditions, including allergic disorders, haematological and other neoplastic diseases and infections, particularly helminthic [9]. This study was conducted to find out the co-relations between various haematological parameters among secondary public school going children. In our study, mild to moderate graded anaemia was seen in 66.9% of children which is strongly supported by the DLHS-4 (District level health survey - 4) as it has shown anaemia in 64.3% among 10-19 year age group in Nashik district [13]. Pradhan P et al reported 23.71% of the rural public school children found to be harbouring one or more intestinal parasites [14]. Makkar A et al reported 52%, 34% and 14% patients with mild, moderate and severe eosinophilia [15]. The prevalence of eosinophilia was present in the current study, there were 45.38% of children having high eosinophil count. Eosinophil counts with TLC showed an intermediate positive co-relation (Figure 1). In majority of cases, microcytic hypochromic anaemia was found, which might be due to nutritional deficiency.

Conclusion

Eosinophilia is more common among children of Nashik district in our study. Though serological analysis could not be done, Allergic reactions are seem to be most common possible cause of eosinophilia. Serological analysis should be performed to reach the final conclusion regarding etiology.

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Study of Frequency of System Involvement and Survival Period in Sudden Natural Non-Traumatic Deaths

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Abstract

Background: Many cases of sudden natural non-traumatic deaths (SNND) occur in individuals without known medical diseases. Many systems, more commonly cardiovascular and respiratory, are known to be involved in such deaths. This prospective autopsy based study was decided to determine the frequency of system involvement & survival period in sudden natural non-traumatic deaths. *Material and Methods:* During the study period from 1st October 2010 to 31st August 2012 total 1711 consecutive medico-legal autopsies were performed by the Department of Forensic Medicine and Toxicology, S.V.N. Government Medical College, Yavatmal, of which 125 (7.3%) cases were turned out to be of SNND, which were studied to determine the frequency of system involvement & survival period. *Results:* Maximum i.e. 41 (32.8%) cases were related to cardiovascular system causes followed by 32 (25.6%) to respiratory system causes. 17 (13.6%) cases related to central nervous system causes, 20 (16%) were related to gastrointestinal system causes, 05 (04%) due to genitourinary system causes and 10 (08%) were of miscellaneous causes. Out of cardiovascular causes, coronary artery disease contributed for 80.4% of cases. Out of total 125 cases, 71 (56.8%) cases survived less than 6 hours, 22 (17.6%) survived between 06 to 12 hours, 23 (18.4%) survived between 12 to 18 hours and 09 (7.2%) survived between 18 to 24 hours. It is pertinent to note that the primary system involved has had direct correlation with survival period. Out of cardiovascular cases, 37 (90.2%) survived less than 6:00 hours and 17 (41.5%) survived less than 1:00 hour. The system wise difference in period of survival was found to be statistically significant in hours (χ^2= 46.91, p= 0.00003801). Average survival period for SNND cases was 06:56±0.26 hours and lowest i.e. 02:37±0.14 hours for deaths due to cardiovascular causes. *Conclusion:* Cardiovascular system pathologies remain the leading cause of sudden natural non-traumatic deaths with lowest survival period in this study. The people should undergo regular medical check-ups for early detection and proper management of cardiovascular diseases. Importance of survival period is for the assessment of suddenness of death, vulnerability of system and for future planning and providing of transport facilities and emergency medical service depots to cope with immediate events prior to death.

Keywords: Sudden Natural Non-Traumatic; Deaths; Autopsy; System Involvement; Survival Period.

Introduction

The World Health Organization (WHO) defines the sudden death as a death, which occurs within 24 hours from the onset of terminal illness [1].

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Natural deaths are those which occur entirely due to natural diseases without any trauma, poisoning or accidental or suicidal or homicidal in origin. An apparently healthy individual of any age dies suddenly and unexpectedly without any pre-indication or in case of natural death under suspicious state; a suspicion of foul play may arise. These cases may also be subjected to medico-legal autopsy [2].

Sudden natural deaths undoubtedly constitute a significant portion of deaths which undergo autopsy for investigation of death. Therefore, prospective autopsy based study was decided to determine the frequency of system involvement & survival period in sudden natural non-traumatic deaths (SNND).

Material and Methods

During the study period from 1st October 2010 to 31st August 2012 total 1711 consecutive medico-legal autopsies were performed by the Department of Forensic Medicine and Toxicology, S.V.N. Government Medical College, Yavatmal, of which 125(7.3%) cases were turned out to be of SNND, which were studied to determine the frequency of system involvement & survival period.

Results

Out of total 125 cases of SNND, maximum i.e. 41 (32.8%) cases were related to cardiovascular system causes followed by 32(25.6%) to respiratory system causes. 17(13.6%) cases related to central nervous system causes, 20(16%) were related to gastrointestinal system causes, 05(04%) due to genitourinary system causes and 10(08%) were of miscellaneous causes. Out of cardiovascular causes, coronary artery disease contributed for 80.4% of cases (Table 1).

It was observed that, 71(56.8%) cases survived less than 6 hours, 22(17.6%) survived between 06 to 12 hours, 23(18.4%) survived between 12 to 18 hours and 09(7.2%) survived between 18 to 24 hours. It is pertinent to note that the primary system involved has had direct correlation with survival period. Out of cardiovascular cases, 37(90.2%) survived less than 6:00 hours and 17(41.5%) survived less than 1:00 hour. Cardiovascular system involvement was observed to be associated with minimum survival period (Table 2).

The system wise difference in period of survival was found to be statistically significant in hours (χ^2= 46.91, p= 0.00003801).

Survival period means duration between onset of terminal symptom and death. It was observed that, average survival period for sudden natural non-traumatic death causes was 06:56±0.26 hours, 02:37±0.14 hours for cardiovascular, 07:59±0.27 hours for respiratory, 06:40±0.18 hours for central nervous, 11:03±0.31 hours for gastrointestinal, 09:06±0.23 hours for genitourinary and 12:19±0.26 hours for miscellaneous causes (Table 3).

Table 1: Systems involved in SNND cases (n=125)

System	No. of Cases (%)
Cardiovascular System	41 (32.8%)
Respiratory System	32 (25.6%)
Central nervous system	17(13.6%)
Gastrointestinal system	20 (16%)
Genitourinary system	05 (4%)
Miscellaneous	10 (8%)

Table 2: Distribution of SNND cases as per survival period (n=125)

Primary system involved	Survival Period (In Hours)				Total (%)
	00 to 06	06 to 12	12 to 18	18 to 24	
	Number of cases (percentage)				
CVS	37 (90.2%)	02 (4.9%)	02 (4.9%)	00 (00%)	41 (100%)
RS	15 (46.9%)	08 (25%)	06 (18.8%)	03 (9.3%)	32 (100%)
CNS	08 (47%)	07 (41.2%)	02 (11.8%)	00 (00%)	17 (100%)
GIT	07 (35%)	02 (10%)	07 (35%)	04 (20%)	20 (100%)
GUT	02 (40%)	01 (20%)	02 (40%)	00 (00%)	05 (100%)
MISC	02 (20%)	02 (20%)	04 (40%)	02 (20%)	10 (100%)
Cases (%)	71(56.8%)	22(17.6%)	23(18.4%)	09(7.2%)	125(100%)

(χ^2= 46.91, Degree of Freedom 15, p= 0.00003801).

Table 3: System wise survival period of SNND cases (n=125)

Cause / No. of cases	Survival period (Hours : Minutes)		
	Minimum	Maximum	Average ± SD*
Cardiovascular / 41	00:15	17:25	02:37 ± 0.14
Respiratory / 32	00:20	23:15	07:59 ± 0.27
Central nervous / 17	00:30	14:30	06:40 ± 0.18
Gastro intestinal / 20	00:40	22:00	11:03 ± 0.31
Genitourinary / 5	02:15	16:00	09:06 ± 0.23
Miscellaneous / 10	02:55	21:00	12:19 ± 0.26

*SD = Standard deviation

Discussion

System Wise Distribution

It is very important to know the vulnerability of system in cases of SNND in planning for speciality care services in rural set ups to prevent SNND. In present study (Table 1), Maximum i.e. 41(32.8%) cases were related to cardiovascular system causes followed by 32(25.6%) to respiratory system causes. 17(13.6%) cases related to central nervous system causes, 20(16%) were related to gastrointestinal system causes, 05(04%) due to genitourinary system causes and 10(08%) were of miscellaneous causes. This observation is consistent with matter quoted by Nandy [3], Reddy [1], Dikshit [4] and Udnoon et al [5].

Most vulnerability of the cardiovascular system for SNND is attributed due to the risk factors, emotions, dietary habits, sedentary life style, addictions, physical and mental stress effect individually or collectively.

Survival Period

Survival period means duration between onset of terminal symptom and death. The definition as to what constitute sudden death is variable. Depending on one's definition, the maximum time interval varies anywhere from 1 to 24 hours. So sudden death may be 1) Instantaneous death – Literally, the individual falls down dead. 2) Death within one hour of onset of symptoms. 3) Death within 1-24 hours of onset of symptoms [6]. Spain et al [7] divided cases into three groups i.e. 1) less than one hour 2) between one and three hour and 3) undetermined (un witnessed). Kuller et al [8] distributed cases in two groups i.e. less than 12 hours and 12-24 hours. Topaz and Edwards [9] used the definition of sudden death as, an unexpected natural phenomenon in which loss of all vital functions occurs instantaneously or within 6 hours of the onset of symptoms of collapse.

In the present study (Table 2), it was observed that, maximum 71 (56.8%) cases survived less than 6 hrs, 22 (17.6%) survived between 06 to 12 hrs, 23 (18.4%) survived between 12 to 18 hrs and 09 (7.2%) survived between 18 to 24 hrs.

In the present study (Table 3), it was observed that, average survival period for SNND cases was 06:56±0.26 hours and lowest i.e. 02:37± 0.14 hours for deaths due to cardiovascular causes.

Out of cardiovascular cases (Table 2), 37(90.2%) survived less than 6:00 hours and 17(41.5%) survived less than 1:00 hour. This is consistent with the matter quoted by Park [10], studies of Scott et al [11] and Topaz and Edwards [9]. It is very important to assess the survival period in case of SNND to know the rapidity of deaths, vulnerability of system and for future planning and providing of transport facilities and emergency medical service depots to cope with immediate events prior to death.

Conclusion

To conclude, cardiovascular system pathologies remain the leading cause of sudden natural non-traumatic deaths with lowest survival period in this study.

Although the study was conducted in rural district set up the people should be more conscious of their health and undergo regular medical check-ups for early detection and proper management of cardiovascular diseases. Importance of survival period is for the assessment of suddenness of death, vulnerability of system and for future planning and providing of transport facilities and emergency medical service depots to cope with immediate events prior to death.

Conflict of Interest: None to declare

Source of Funding: Nil

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Original Article

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An Autopsy Study of "Sudden Death Cases" in Tertiary Care Hospital

Rajesh Para[1], Vijay Halmandge[2]

Abstract

Introduction: Sudden death is one of the common mode of the death now a days. According to ICD 10 of the World Health Organization sudden death is defined as "Death occurring in less than 24 hours from onset of symptoms not otherwise explained". It also emphasizes that sudden death is better known as non-violent or instantaneous for which no cause can be discovered. Despite modernization in medicine, the diagnosing tools lack in accuracy to find clinical cause of death in comparison with autopsy cause of death. Across all age groups, cardiac related diseases play a significant role in both sudden and unexpected death. In this study, cases of sudden deaths are examined histopathologically to establish possible causes of the sudden deaths. *Aim:* To study histopathology of the organs of sudden death cases in autopsy and identify common but clinically important causes of sudden death. This study would show the impact of lifestyle of our society and thus help to increase awareness in population at risk as well as lifestyle modification which might reduce the incidence of sudden death. *Material and Method:* A study of autopsies of sudden deaths between August 2014 to July 2017(3 Years) at department of Pathology, BRIMS, Bidar. *Result:* Total autopsies received during August 2014 to July 2017 were 198, among which those with sudden death were 54 cases (27.27%). The age ranged from 11 years to 90 years, among which sudden death was maximum in 41 to 60 years of age and males were affected more than the females. Out of 54 sudden deaths, 37 cases (68.52%) died of cardiovascular causes, mainly myocardial infarction; while 17cases (31.48%) were of non cardiac causes, in which pulmonary aetiologies predominate. Among 37 cases of cardiovascular causes, 9 had other co-morbid conditions. *Conclusion:* It is concluded that sudden deaths were more common in 4th and 5th decade of life with male preponderance and most common causes are cardiovascular, while sudden deaths between 11 to 30 years of age were mainly due to non cardiac causes.

Keywords: Sudden Death; Autopsy; Cardiovascular and Non Cardiac Causes.

Introduction

Sudden, unexpected deaths can occur in all age groups; however etiologies vary by age [1]. According to ICD 10 of the World Health Organization, sudden death is defined as "Death occurring less than 24 hours from onset of symptoms not otherwise explained." It also emphasizes that, sudden death is better known as non- violent or instantaneous for which no cause can be discovered [2]. Despite modernization in medicine, the diagnosing tools lack in accuracy to find clinical cause of death in comparison with autopsy cause of death [3]. Across all age groups, cardiac-related diseases play a significant role in both sudden and unexpected death [1]. Sudden cardiac death can be prevented, if high risk patients are identified and referred to a cardiologist [4]. According to Birth and Death Registration Act 1969 in India, it is mandatory to issue a death certificate. Hence, such deaths must undergo an autopsy to determine the exact cause of death [5].

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Materials and Methods

The study was conducted in the department of Pathology, BRIMS, Bidar, Karnataka, India between

August 2014 to July 2017. During this period total number of autopsies done were 198 cases, out of which those of sudden death were 54 cases.

Inclusion Criteria

1. All cases of sudden deaths within 24 hours of onset of symptoms, of all age groups.
2. Cases of sudden deaths of any sex.
3. Cases which had controlled diabetes and hypertension were included in the study .

Exclusion Criteria

1. Cases of deaths after 24 hours of onset of symptoms.
2. Cases with any assault, road traffic accidents, suicides or identifiable cause.
3. Cases with pregnancy and related deaths.
4. Unidentified dead body were excluded from the study.

Information about time of death since appearing of symptoms were checked in Post-mortem notes of all cases labelled as "Sudden Deaths" in Department of Forensic Medicine, BRIMS, Bidar.

In all cases, organs received were Heart, Lungs, Liver, Kidneys, Spleen, Brain with detailed information at autopsy from the Department of Forensic Medicine.

All organs were grossly examined and then fixed in 10% Formalin for atleast 24 hours. Multiple sections of 4-5 mm thickness were taken. All sections were numbered and processed in automated tissue processor, subjected to paraffin section of 4µm thickness and then were stained with routine haematoxylin and eosin stains [5]. All slides were histopathologically examined and cause of death was ascertained.

Results

Total number of Autopsies received during Aug 2014 to July 2017 in the Dept of Pathology, BRIMS, Bidar for Histopathological study of organs were 198 cases, out of which those of sudden death were 54 cases (27.27%). Among these cases, Males (45 cases) outnumbered females (9 cases) with M: F with ratio of 5:1. The age of these cases ranged from 11 to 90 years with peak seen in 41-60 years age group (Table 1).

Table 1: Age Distribution of cases of Sudden Death

Age (in years)	No. of Cases	Percentage (%)
0-10	0	0%
11-20	4	7.40%
21-30	9	16.66%
31-40	8	14.81%
41-50	12	22.22%
51-60	13	24.10%
61-70	06	11.11%
71-80	01	1.85%
81-90	01	1.85%
91-100	00	00%
Total	54	100%

Table 2: Histopathological distribution of cases of sudden deaths

Cause	No. of cases	Percentage (%)
Cardiovascular	37	68.52
Non cardiac	17	31.48
Total	54	100

Table 3: Distribution of non cardiac cases of sudden death

Systems involved	No. of Cases of the Deaths	Percentage (%)
Pulmonary	11	64.7
Renal	2	11.76
Central Nervous System	2	11.76
Hepatobillary	2	11.76
Total	17	100

Table 4:

Comorbid Conditions	Number of the Cases
Hypertrophy of left ventricular wall	5
Benign nephrosclerosis	1
Acute tubular necrosis	1
Hypertension	1
CVC lung	1
Total	9

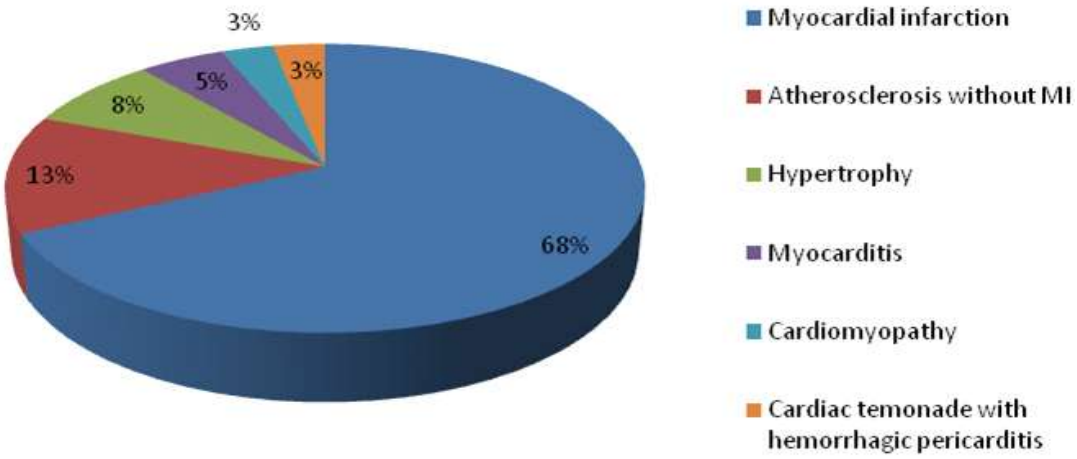

Chart 1: Distribution of cardiovascular causes

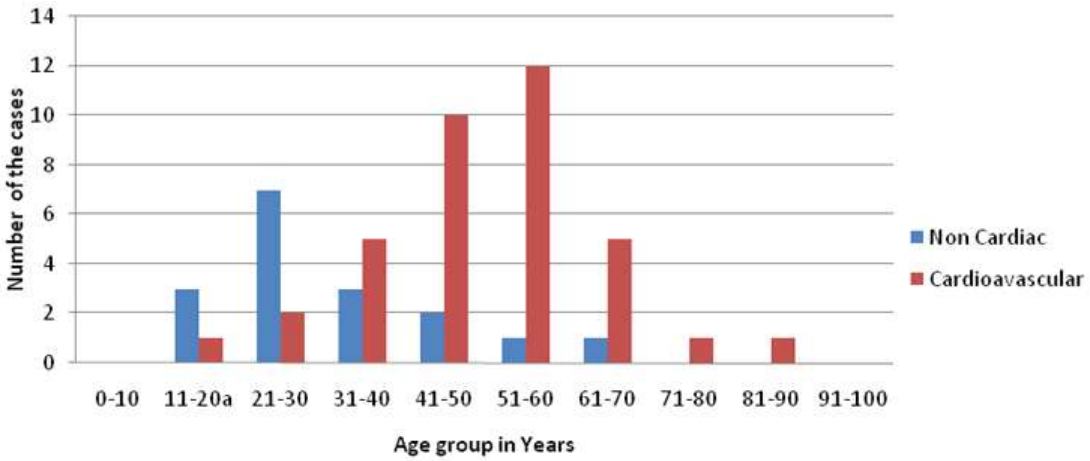

Chart 2: Age wise distribution of cardiovascular and Non cardiac causes

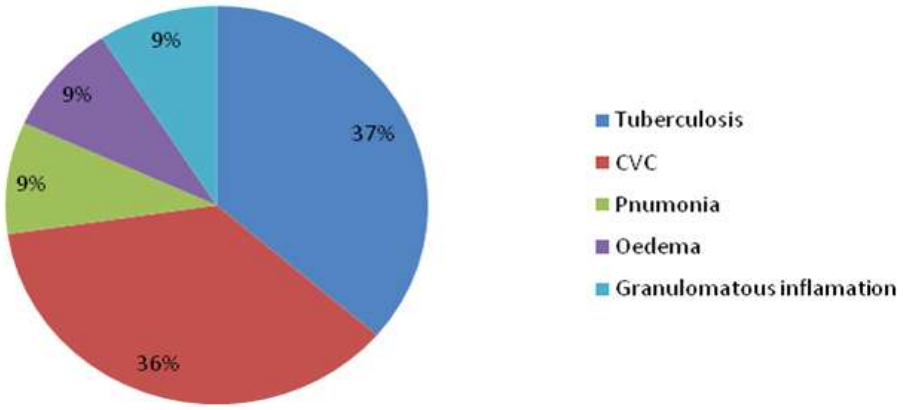

Chart 3: Pulmonary causes

Cardiovascular causes [37cases (68.52%)] was the commonest cause of sudden death, while non cardiac causes [17 cases (31.48%)] were least common. In the latter category, aetiologies were pulmonary causes 11 cases (64.70%), followed by renal, CNS and Hepatobiliary with 2 cases (11.76%) each.

Among the cardiovascular causes, 25 cases (67.56%) had aetiology of myocardial infarction, while 5 cases (13.51%) had atherosclerosis without any changes of myocardial infarction or hypertrophy. While 3 cases (8.10%) had only hypertrophy of left ventricle, myocarditis was identified in 2 cases (5.40%) and Cardiomyopathy and cardiac tamponade with hemorrhagic pericarditis was present in 1 case each (2.70%) (Chart 1).

Categorisation of cardiovascular and non cardiac aetiologies were done to study age groups. Sudden deaths in 11 to 30 years age groups were mainly due to non cardiac causes, while deaths in age of 31 to 70 years age group were due to cardiac causes (Chart 2).

Discussion

Determination of cause of death in natural deaths, particularly when the death occurred suddenly, unexpectedly or in the young, is an important part of Autopsy practice [1]. Most of the literature identified cardiovascular causes as the most common cause [6-10]. Sequential autopsy examination in sudden death investigation was suggested by Sheppard et al where the first step was to consider natural death, followed by exclusion of noncardiac natural death-like hemorrhage, next was to consider macroscopic findings (e.g., ischemic cardiac disease) and microscopic findings (e.g., myocarditis) in heart. Finally, reappraisal of history and toxicology screen need to be done [11-12].

From Total 54 cases of sudden death, 37(68.52%) deaths were due to cardiovascular causes. Among cardiovascular causes myocardial infarction (MI) was the most common cause comprising of 25 cases (67.56%) followed by atherosclerosis without any change of MI or hypertrophy, Hypertrophy of left ventricle, myocarditis, cardiomyopathy and cardiac tamponade with hemorrhagic pericarditis as shown in Chart 1. These results are comparable with the literature of Pathology of Sudden Natural Death and WHO/ Cardiovascular Diseases; fact sheet review [1&13]. Similar studies by Thomas A C et al , Farb A et al and chugh s s et al also stated that sudden deaths were most common due to cardiac diseases and occurred most commonly in males [6,7,10].

According to WHO fact sheet about cardiovascular disease of June 2016, CVDs (Cardio Vascular Diseases) are the number one cause of death globally, more people die annually from CVDs than from any other cause. An estimated 17.7 million people died from CVDs in 2015, representing 31% of all global deaths. Of these deaths, an estimated 7.4 million were due to coronary heart disease and 6.7 million were due to stroke. Over three quarters of CVD deaths occur in low- income and middle-income countries. Out of the 17 million premature deaths (under the age of 70 years) due to non communicable disease in 2015, 82% are in low-and middle – income countries and 37% are caused by CVDs [13].

In the present study, among 25 cases of Myocardial Infarction, 9 cases had comorbid conditions, most common being hypertrophy of left ventricular wall and others were renal, hypertension and CVC (Chronic Venous Congestion) lung (Table 4).

Comorbid Conditions	Number of the Cases
Hypertrophy of left ventricular wall	5
Benign nephrosclerosis	1
Acute tubular necrosis	1
Hypertension	1
CVC lung	1
Total	9

These results are comparable with study of David D et al and Lekston A et al with respect to Multiple cardiovascular comorbidities and acute myocardial infarction and Impaired renal function in acute myocardial infarction [14,15].

In this study, other than the cardiovascular diseases, second most common cause of sudden death was pulmonary cause [11 cases (20.37%)] . Among these tuberculosis and chronic venous congestion (CVC) predominates accounting for 4 cases each. Few of them attributed to oedema, pneumonia and granulamatous inflammation comprising of a case each (Chart 3).

This study corroborated with study conducted by Bobrowitz [16]. The increase in frequency of sudden death due to undiagnosed tuberculosis is a major concern, where some individuals may have had a coexisting condition, masking it [17].

Other causes include renal 2 cases (11.76% of total), central nervous system disease 2 cases(11.76% of total), Hepatobilliary 2 cases (11.76% of total). Among the renal causes, ATN (Acute Tubular Necrosis) was found in both cases. This result was in comparison with study done by Gill N et al [18].

Among CNS causes, subarachnoid hemorrhage was seen in one single case while one case had associated reactive gliosis. These findings are comparable with study of M Black et al [19].

The hepatobilliary cause was CVC(Chronic Venous Congestion). This is similar to study by Jamila Alagarsamy et al [20].

Conclusion

This study concludes that sudden deaths are more common in 4th and 5th decade of life with male preponderance and most common causes are cardiovascular, while sudden deaths due to non cardiac causes are mainly seen in 11 to 30 years age group.

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Study of Awareness of Organ Donation in Medico and Non Medico Students

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Abstract

Though all of us agree that organ donation is the need of the hour, myths and misconceptions regarding it abounds accompanied with very poor knowledge and attitude towards this noble act. The rate of organ donation in India is low and research on organ donation among the general population is limited. Lack of knowledge and understanding about organ donations, religious attitudes, and superstitious beliefs have generated fear and mistrust in the minds of the common man and, especially, the terminally ill patients [1,2]. There is an inadequate supply of cadaver organs commensurate with need. Health-care professionals are the critical link in augmenting public awareness about organ donation. Their knowledge and beliefs can influence the public opinion. This descriptive cross sectional study aims at understanding the perception, knowledge and awareness among the medical graduate students and students from police training as constables. A total 200 students participated in the study. A specially de-signed questionnaire was used in assessment.

Keywords: Awareness of Organ Donation; Perception; Knowledge.

Introduction

"Human organ" means any part of a human body consisting of a structured arrangement of tissues which, if wholly removed, cannot be replicated by the body.

Organ donation is when a person allows to be removed, legally, either by consent while the donor is alive or after death with the assent of the next of kin. Organs can be donated by three types of donors viz., living, brain-dead and dead donors. Experts say that the organs from one donor can save or help as many as 50 people [3]. Commontransplantations include: kidneys, heart, liver, pancreas, intestines, lungs, bones, bone-marrow, skin, and corneas. Some organs and tissues can be donated by living donors, such as a kidney or part of the liver, but most donations occur after the donor has died i.e. cadaver donation.

Although, organ donation is a personal issue, the process has medical, legal, ethical, organizational and social implications [4]. Organ donation following brainstem dead is not so common but still a new concept of general population. India has a fairly well developed corneal donation programme; however, donation after brain death has been relatively slow to take off. To curb organ commerce and promote donation after brain death the government enacted a law called "The Transplantation of Human Organs Act" in 1994 that brought about a significant change in the organ donation and transplantation scene in India in a legalized way [5]. Yet the rate of organ donation in India is poor (0.34 per 100 000 population) compared to developed countries [6].

Every year, close to six lakh people die due to organ failure [7]. Organ transplantation is the most preferred treatment modality for end-stage organ disease and organ failures [1]. However, the need for the transplants is high and the gap between organs available for transplantation and the number of patients waiting for a transplant is widening globally.

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The wide spread awareness regarding the concept of organ donation, the knowledge of existing laws, inherent importance attached to it of saving others life clubbed with the willingness to be a part of the mission and promote it by propagation would only fill the gap of shortage of organs. However, there are a lack of studies done on the terminally ill patients and the general public with regards to their perceptions and attitudes about organ donation [8]. Since organ transplantation cannot succeed without the majority participation and support of the community, these urban legends are dangerous. With this backdrop a study was planned and implemented with the objectives of ascertaining the knowledge, perception and willingness of the medical and police training students regarding organ donation.

Materials and Methods

Questionnaire has been given to all the participants' i.e. second M.B.B.S and police trainee 100 students respectively. All the technical words in the questionnaire have been explained to them in detail.

Inclusion Criterion

All the students in both the groups are in age range of 19-21 years and from different parts of Maharashtra.

Exclusion Criterion

The students from outside Maharashtra and not in the age range of 19-21 years.

Age range and study area is to maintained uniformity. Medical students and police trainee students both have been taught legalities of organ donation during their curriculum. Hence these two groups were taken.

The questionaries' contained 15 questions with answers varying from Agree, Disagree, Yes, No and Not sure. The questionnaire was designed to know awareness, perception, knowledge related to organ donation and willingness and promotion to donate organs.

Study Design

Cross sectional study.

Study Size: 200 students.

Study Population

Medical students of Dr. V.M. Government Medical College, Solapur, and Students taking training of police constables.

Statistical Methods: Frequency and median score of each question.Based on the responses the data was tabulated, statistically scrutinized and critically analysed.

Ethical Issue: No invasive or non invasive test has been done. Only cognitive domain and perceptions have been tested without revealing the identity of any student hence no need of ethical committee clearance.

Observation and Results

Based on the responses given by Medical students and Students taking training of police constables following observations have been deduced and based on observations the conclusions have been drawn.

As per question number 1, although 89% of the students believed that they were aware of Human organ donation but as evaluated from their awareness through question number 3,4,5,6 on an average only 43.62% knows the correct alternative.

Appendix 1. Questionnaire regarding Perception and willingness

Sr. No.	Question
1	Are you aware of Human Organ donation?
2	Organ donation is against my religious belief.
3	Whether living person can donate his kidney?
4	Any person can sell his own organs.
5	A living person can donate his organs to any unknown person during his/her life.
6	I fear that the organ donated by me will be misused for commercial gain
7	I will encourage my family and friends to donate organs
8	Organ donation is good and should be encouraged.

Table 1: Response of the students as regards to perception and willingness towards organ donation. (correct alternative has been kept bold)

Question	Response	Police trainee	Medical students	Total	%
1.	**Yes**	**88**	**90**	**178**	**89**
	No	03	02	5	2.5
	Not sure	09	08	17	8.5
2	Agree	10	01	11	5.5
	Disagree	**70**	**92**	**160**	**80**
	Not sure	20	07	27	13.5
3	**Yes**	**81**	**99**	**180**	**90**
	No	05	00	5	2.5
	Not sure	14	01	15	7.5
4	Agree	20	28	48	24
	Disagree	**47**	**61**	**108**	**54**
	Not sure	33	11	44	22
5	Agree	78	80	158	79
	Disagree	**13**	**11**	**24**	**12**
	Not sure	09	09	18	9
6.	Agree	74	46	120	60
	Disagree	**08**	**29**	**37**	**18.5**
	Not sure	18	25	43	21.5
7	**Yes**	**84**	**96**	**180**	**90**
	No	09	00	9	4.5
	Not sure	07	04	11	5.5
8	**Agree**	**95**	**99**	**194**	**97**
	Disagree	01	00	1	0.5
	Not sure	04	01	5	2.5

Their willingness and attitude is evaluated through question number 2, 7, 8 and it was found a positive attitude i.e. 89% of the studied population is having positive attitude towards organ donation.

As regard to religious sentiments attached to the organ donation medical students have more rational and scientific approach (92% disagree) as compared to police trainee (70%), but in not sure group or in a group of dilemma there are 20% police trainees.

99% of the medical students aware of the fact that kidneys could be donated during life in contrast to police trainees (81%).

24% of the students still unaware of the fact that commercial dealings in the organs has been curbed late back.

79% of the studied group still believe that a person can donate his organs to anyone irrespective of blood relations or special affinity.

74% of the police trainees have an inherent fear that the organs donated by them might be used for commercial gain. In this regard 56% of medical students have the similar opinion.

Although no major difference but medical students were more proactive towards organ donation and its promotion as compared to police trainees as seem from question 7 and 8.

Appendix 2: Questionnaire to test legal knowledge and procedures.

Sr. No.	Question
1	Blood donation came under the purview of Human Organ Transplantation Act.
2	In medico-legal cases, organ donation can be done with the consent of donor or legal heirs without the consent of police
3	Can next of kin donate organs of dead without his/her prior will during life?
4	To retrieve cornea enucleation is done
5	Sperm donation and oocyte donation is part of organ donation.
6	As per HOTA Act in every Medico-legal case the person going to conduct autopsy has to certify that the organ to be retrieved is not related to cause of death.
7	As per HOTA Act, surgeon from team of organ transplantation should be a part of brain death declaration team.

Table 2: Response of the students as regard to their knowledge regarding legalities related to organ donation. (correct alternative has been kept bold)

Question	Response	Police trainee	Medical students	Total	%
1	Agree	41	31	72	36
	Disagree	**10**	**48**	**58**	**29**
	Not sure	49	21	70	35
2	Agree	17	33	50	25
	Disagree	**57**	**48**	**105**	**52.5**
	Not sure	26	19	45	22.5
3	**Yes**	**54**	**51**	**105**	**52.5**
	No	22	32	54	27
	Not sure	24	17	41	20.5
4	**Agree**	**48**	**28**	**76**	**38**
	Disagree	08	22	30	15
	Not sure	44	50	94	47
5	Agree	34	16	50	25
	Disagree	**08**	**63**	**71**	**35.5**
	Not sure	58	21	79	39.5
6	**Agree**	**82**	**78**	**160**	**80**
	Disagree	04	07	11	5.5
	Not sure	14	15	29	14.5
7	Agree	29	48	77	38.5
	Disagree	**07**	**29**	**36**	**18**
	Not sure	64	23	84	42

The overall combined awareness of legal knowledge regarding organ donation in studied population is 43.64%. However the simple basic things regarding exclusion of blood, sperm and oocyte donation from organ donation act as revealed from question 1 and 5 only 32.25% awareness is present. As far as medico-legal issues regarding organ donation are concerned 66.25% studied group are well aware. As regard to general provisions of HOTA as revealed through question 3 and 7 only 35.25% of population are well acquainted.

The most common organ to retrieve after death is cornea but only 38% of studied population are aware regarding the enucleation procedure required to retrieve cornea.

Regarding tissue and body fluids to be donated there is a wide gap in the knowledge of medical students and police trainee. Only 10% of police trainee as compared to 48% medical students and 8% as compared to 63% are well aware regarding blood and oocyte, sperm donations exclusion from respectively HOTA. Surprisingly regarding the procedure of enucleation police trainee (48%) are more aware as compared to medical students (28%).

And as regard to the provision of debarring the doctor of transplantation team from brain death declaration panel medical students are more aware (29%) as compared to police trainee (7%).

Discussion

We aimed to assess knowledge,perception and willingness of the police trainee personal and medical students towards organ donation. These two groups have been deliberately selected as in future as a RMP, medical students have to propagate this noble cause in the community and as a non medicos police personal have to deal with legalities of organ donation, curbing the commercial dealings in this aspect and to deal with the medico-legal cases pledging their organs for donation.

Notification of Health and family welfare [9], 27th March, 2014 section 3 authorizes a living person to give authority of removal his/her organs during life or after death. Section 5 (sub section 1. a), deals with authorisation by a person by a person during life and subsection 1. b deals with the procedure if such authorization was not given during life and still if the relatives had wish to donate the organs the requisite procedure to be followed. Subsection 1.b also deals with the procedure of authorization in case of unknown/unclaimed bodies wherein the authority has been given to the authorities in law full possession of the dead body.

Section 5, subsection 4. (c) and section 18 subsection (7), debarred a person from the part of brain death declaration team if such RMP is the part of transplantation team.

Section 6 deals with the procedure to be followed for donation of organs or tissue in medico-legal cases. As per subsection 4 of this section wherever possible the designated post-mortem RMP should be present during retrieval so that he should incorporate the findings related to the retrieved organs in the post-mortem memorandum. Otherwise after informing the inquest conducting police authority and no objection from them the retrieval team should proceed with organ retrieval and send the detailed note regarding the condition of the organ retrieved with all other relevant findings along with inquest to the autopsy surgeon.

The Transplantation of Human Organs (Amendment) [10] Act 2011 section 5subsection (oa) defines tissue as group of cells performing a particular function in human body, hence except blood and other body fluids. Subsection (0b) excludes blood bank from the purview of "tissue bank"

Section 9 of the principal act has been amended by incorporating section 7 with all its subsections from a to c wherein donation to non related persons have been meticulously checked and such donations have been passed through a series of verification to rule out any commercial dealing. Swapping is allowed in exceptional case, otherwise all the donated organs after death have been transplanted to the needy as per the waiting list available with state authority authorized in this regard.

Section 18 of the act as inserted after section 19 of the principal act deals with punishment for illegal dealings in human tissue.

In the backdrop of this intelligentsia the Perception of participants towards general concept of organ donation has been tested through the questionnaire as provided in appendix 1 and as revealed through Table 1.

The majority (89%) of participants in our study were claimed that they are aware of organ donation and these findings are similar to those of previous studies [6,11,12].

Kidney and part of the liver are the organs a person can donate before death during life. 90% of them are aware that any living person can donate their kidneys during life, but medicos (99%) are more enlightened in this aspect as compared to non medicos group of police trainee (81%).

Regarding the aspect of curbing of commercial dealings in human organs by the act and the pre-requisite blood relations or the relation of special affinity, love required between the recipient and donor there is widespread ignorance in both the groups and overall awareness regarding these common issues was only 43.62%.

Majority of the participants (89%) have shown the inherent desire and willingness towards organ donation over and above the religious sentiments and also in favour of the promotion of donation among their relatives and friends and in community at a large. This aspect of their willingness is more important in the veil of their ignorance regarding commercial dealings, in spite of the fear of being misused of the organs they have being donated 60% have shown positive attitude towards this noble cause.

Maximum 80% of them showed religious beliefs against organ donation which coincide with study of Alashek WA et al [13]. This study also coincides with to a study (86%) done in Faisalabad [14] and slightly better than a study (78%) done among adults of Kakati Village [15] in South India.

However, illegal organ donation and misuse of organs are the main reasons for the low rate of organ donation in India [7]. Similar to previous studies, 74% of individuals opined that organs for transplant can be bought and sold in India and this can be a major barrier to organ donation [16]. Illegal organ donation and misuse of organ is a major problem in India for low organ donation rate in public [7] this fact was reflected even in the current study as 60% of the subjects reported misuse of organ as barrier to organ donation.

Concerning about willingness and promotion of Organ Donation, 89% of participants feel that organ donation and transplantation is good and should be encouraged, which can be termed as overwhelmingly positive.

In our study, 43.64% of participants had adequate knowledge about Acts and rules of organ donation. These findings were comparable to a previous study that showed 41.5% of participants had knowledge about organ donation [17].

This study does notcoincide with Manojan KK et al [12] where only 3% of participants knew about the proper Legislation associated with the process of organ donation. This might be due to low literacy rate in the studied population encompassed with rural background wherein promotion and propaganda of such laws is very less.

Knowledge regarding who can give consent for donation while alive and after death is far less (52.5% in studied population) than the results found in studies in Karachi [18] and Chennai [19].

Traditionally in India, the family takes care of its members even when they are sick. Hence, the consent

of the next of kin is mandatory for organ donation from a deceased donor [20]. Further, 54.9% of participants felt that after their death it is important to know their family's wishes. In a recent study, 83% of people thought that family/spouse should have the right to make a decision for organ donation [19]. Thus, a positive attitude towards organ donation is necessary among family members. Maintaining body integrity even after death seems to be the most common reason for unwillingness to donate organs.

Blood and other body fluids don'tcome under the purview of organ donation but as observed there is 32.25% awareness in this regard and a severe ignorance in the non medicos group 41% and 34% regarding blood and sperm donation respectively.

To a reason unknown surprisingly the legal knowledge regarding provisions of THOA in medico-legal cases 66.25% of studied population is well aware. Only 18% of studied population are aware regarding the non inclusion of member from transplant team into the team constituted to declare brain death.

Evidence in the literature indicates that personal experience about organ donation contributes to the knowledge of individuals and subsequently organ donation rates.

Organ donation can be considered as a humanitarian project. It is clearly an act for welfare of mankind and should be considered as a holy task for needful.There are millions of people out there in need of Organs to live a normal life, and there are more than millions out there who can provide them with the same opportunity as of others in their life.

In India, there still a taboo and social stigma on organ donation. With combined approach and educating the masses and encouraging people, the overall goal can be achieved and it can help prevent many severe disabilities and disorders in individuals who rely upon.

Knowledge level is an important determinant for willingness to donate organ which is in line with the reports of other studies [18]. Hence continuous emotional appeal through various mass media, propagation and promotion of organ donation laws and prudential through various mass campaigning would only fetch the striving of enormous demand of the organs in the community.

Conclusion

Better knowledge and awareness will help in promoting organ donation. Effective campaign needs to be driven to educate people with relevant information with the involvement of media, doctors and religious scholars. Our study advocates for public education programmes to increase awareness among the general population about the legislation related to organ donation.

The majority of participants were unaware of the legislation and the process of organ donation. Our study showed the ignorance in masses hence stressed the importance of the media in creating awareness about organ donation among the general population. Mass awareness campaigns to promote organ donation activities and the fact that organ donation can bring smile to the faces of many should be percolated and imparted at both individual and communitylevel.

We suggest that the government should also strengthen the infrastructure of hospitals to maintain potential brainstem dead donors.

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Role of Fine Needle Aspiration Cytology in Primary and Metastatic Lymph node Neoplasms among Patients attended at Tertiary Teaching Health Care Hospital, Mumbai

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Abstract

Context: Lymph nodes are common sites for primaries as well for different metastatic cancers. Thus clinical recognition and urgent diagnosis of palpable lymphadenopathy is of paramount importance specially to differentiate between inflammatory lesions or metastatic or primary neoplastic tumor. *Objectives:* Role of FNAC in Primary and Secondary Lymphnode Neoplasm among Patients attended at Tertiary Teaching Health Care Centre, Mumbai. *Methods:* A retro-prospective study was carried out on the patients admitted in medical and surgical ward and from OPD with clinically diagnosed lymphadenopathy, in the department of Pathology of LTMMC & GH, Sion, Mumbai, during the period of January 2007 to August 2011. *Results:* In lymphoma group, Non- Hodgkin's Lymphoma was commonest (66.67%) followed by Hodgkin's lymphoma (33.33%). In malignant lymphoma group the diagnostic accuracy was 85.71%. In metastatic group, the commonest metastatic lesion observed was squamous cell carcinoma (65.39%) followed by undifferentiated epithelial malignancy (21.03%), and infiltrating ductal carcinoma of breast in (6.47%). *Conclusion:* Fine Needle Aspiration Cytology is logical extension of the more formalized biopsy procedure, lending itself to saving of time and cost and is convenient for both patients and physician in the management and follow up of malignant lymphadenopathies. FNAC helps in defining the tumor type, while the clinical history and investigations help in identifying the tumor site.

Keywords: Fine Needle Aspiration Cytology; Primary Lymphnode Neoplasm; Metastatic; Tertiary Health Care Centre.

Introduction

Lymph nodes are common sites for primaries as well for different metastatic cancers. Thus clinical recognition and urgent diagnosis of palpable lymphadenopathy is of paramount importance specially to differentiate between inflammatory lesions or metastatic or primary neoplastic tumor [1]. Although open biopsy with histological examination of excised tissue still remains the gold standard for diagnosis of lymph node tumors, yet FNAC (Fine Needle Aspiration Cytology) has now become an integral part of the initial diagnosis and management of patients presenting with lymphadenopathy [1]. This simple technique has gained wide acceptance since it offers a high degree of accuracy, lending the cost of hospitalization [1].

The results of FNAC compare favourably with those of tissue biopsies and in some situations the aspirate has qualities of micro biopsy. Suspicious or doubtful situations should be resolved by surgical biopsy and further by immunohistochemistry and molecular technique whenever required [1].

FNAC of lymph nodes is simple, less traumatic, reliable, repetitive, less expensive and OPD procedure. Anaesthesia is not required, hence can be applied for ambulatory, debilitated or critically ill patients where biopsy is contraindicated. As technically simple procedure, it can be easily performed at remote places in India, where trained staff is not available. It produces speedy results, hence widely accepted by patients and clinicians [2].

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FNAC of lymph nodes helps in staging neoplasms, can give clue to occult primary, can evaluate recurrent neoplasms at an early stage and helps to decide whether surgical excision for histopathological examination is indicated. It also helps clinicians for formulating line of treatment and monitoring response to therapy [3]. The exact diagnosis and subtyping of malignant lymphoma by FNAC has limitations, cytodiagnosis of Non-Hodgkins Lymphoma is confirmed by open biopsy and histological examination. While a confident diagnosis of Hodgkins disease can only be made in presence of typical RS cells in the appropriate background of reactive cells and clinical set up [4]. The aim of present study was to highlight the role of FNAC in diagnosis of primary and metastatic lesions of lymph nodes in a resource challenged environment like ours.

Materials and Methods

Selection of Patient

A retrospective and prospective study was carried out on the patients admitted in various medical and surgical ward and from OPD with clinically diagnosed lymphadenopathy, in Dept. of Pathology, LTMMC & GH, Sion, Mumbai, during the period of January 2007 to August 2011.

Methods

Before performing FNAC, lymph node examination was done and relevant clinical history was noted.

Materials required for FNAC-

1. 10 ml disposable syringe.
2. 21-23 gauge disposable needle of 38 mm long.
3. Swabs with skin disinfectants or spirit.
4. Several standard, clean, grease free glass slides (75×25×1.35 mm), which are properly labelled with slide marker.
5. Cytofixative containing a mixture of equal amount of ether & 70% ethyl alcohol or a hair spray.
6. Completed laboratory request form with full clinical details.
7. Other material- cotton swabs, gloves, sterile dressings.

Procedure / Technique

The procedure is explained to patient after selecting the site. Convenient position was given to patient depending upon the site of aspiration by which the swelling was easily palpable. The overlying skin is cleaned and the swelling was located and firmly fixed between thumb and forefinger of the free hand. The syringe was held by the outside of the pistol grip and needle tip was inserted in the swelling. By firmly closing the fist, the syringe plunger is partially retracted creating a negative pressure.

Without losing pressure or pulling the needle, the whole syringe is rotated by a movement of wrist and gently moved in and out. The cutting edge of the needle tip frees cells inside the swelling which are sucked into the fine base of needle. Using continuous negative pressure, by pulling firmly on plunger of syringe, guide the cutting tip of the needle forwards and backwards, obliquely through the firmly held swelling.

While aspirating, hub of the needle is observed for any aspirate. This is a critical step, as it is necessary to keep aspirated material in the needle and not to aspirate excessive blood, which will dilute the aspirate. Before withdrawing the needle, the negative pressure is slowly released. After the needle is withdrawn from patient, it is removed from the syringe. The syringe is filled with air and needle replaced firmly. The syringe is held vertically or slightly obliquely with the needle tip just above the surface of glass slide, then the contents of needle are blown gently on the slide. Smears are made by inverting a second glass slide over the material and as it spread pulling the slides horizontally or vertically.

Fixation and Staining

The smears are allowed to either fixed immediately by hair spray solution or are air dried. The air dried smears are stained with May-Grunwald Giemsa stain. The hair spray fixed smears are stained with Papanicolaou (Pap) stain. Microscopic examinations of the stained smear were carried out.

Design of Study

A detailed history including age, sex, duration of complaints like enlarged nodes, fever, cough and swelling at other sites etc. are noted.

All cases are broadly classified cytologically. Comparision of cytopathological and histopathological reports are done wherever possible.

Inclusion Criteria

All cases of primary and metastatic lymph node malignancies.

Exclusion Criteria

- Reactive Lymphoid Hyperplasia
- Tuberculous lymphadenitis
- Acute Suppurative Lymphadenitis
- Inadequate material

Results

Table 1 shows that age and gender wise distribution of the neo[plastic lesions of lymph nodes. Most common age group was involved (41-50 years) followed by age group of (51-60 years). Males were affected more than females.

Table 2 shows that the cervical group of lymph nodes were most commonly involved and aspirated in 161(47.49%), cases followed by submandibular 82 (24.19%) cases.

Table 1: Age and gender wise distribution of neoplastic lesions of lymph nodes

Age	0-10		11-20		21-30		31-40		41-50		51-60		61-70		71-80		81-90		Total	
Gender	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**
Hodgkin's disease	1	-	1	-	-	2	1	1	-	1	1	-	-	-	1	-	-	-	5	4
Non-Hodgkin's lymphoma	-	-	1	1	2	1	2	-	-	1	4	2	4	-	0	-	-	-	13	5
Hematolymphoid malignancy	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	2	1
Metastases of Squamous cell Carcinoma	-	-	1	-	7	-	21	9	40	11	47	6	36	10	10	2	1	1	163	39
Metastases of Adenocarcinoma	-	-	2	1	-	-	-	-	-	2	1	-	1	1	-	-	-	-	4	4
Metastases of Infiltrating ductal Ca	-	-	-	-	-	2	-	7	-	6	-	2	-	3	-	-	-	-	-	20
Metastases of Thyroid Ca	-	-	-	-	-	1	2	-	1	-	-	1	-	1	1	-	-	-	4	3
Metastases of poorly differentiated ca	-	-	-	-	5	1	2	3	14	10	12	4	6	5	2	1	-	-	41	24
Metastases of Small Round cell tumor	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Metastases of Nasopharyngeal Ca	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Metastases of Renal cell Ca	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2
Metastatic melanoma	-	-	-	-	1	-	-	-	-	-	-	-	1	-	1	-	-	-	3	-
Total	2	1	5	2	16	7	28	22	55	31	65	15	49	20	15	3	2	1	237	102

Table 2: Distribution of Neoplastic Lymph Node Lesions According to Site of FNAC

	Cervical	Sub-mandibular	Supra-clavicular	Axillary	Inguinal	Post-auricular	Infra-auricular	Total
Hodgkin's lymphoma	4	1	2	2	-	-	-	9
NHL	9	4	1	3	1	-	-	18
Hematolymphoid malignancy	2	-	-	-	1	-	-	3
Squamous cell Carcinoma	106	66	4	5	17	2	2	202

Adeno Carcinoma	-	1	4	1	2	-	-	8
Undiff. Epithelial malig	30	10	16	5	4	-	-	65
IDC Breast	1	-	2	17	-	-	-	20
Thyroid Ca	5	-	2	-	-	-	-	7
Melanoma	1	-	-	-	2	-	-	3
Renal Cell Ca	1	-	1	-	-	-	-	2
Nasopharyngeal Ca	1	-	-	-	-	-	-	1
Small round cell tumor	1	-	-	-	-	-	-	1
Total	161	82	32	33	27	2	2	339
Percentage	47.49	24.19	9.44	9.74	7.96	0.59	0.59	100

Discussion

In this study, majority of the cases were in the age group 41-50 years (25.37%) followed by 51-60 years (23.60%). Similarly, Ellison E et al [5], Ahmed N et al [6] and Alam K et al [7] had maximum incidence in third decade. Males (69.91%) were more commonly affected than females (30.09%) with male to female ratio of 2.32: 1. This was comparable to other studies done by B Steel et al [8], Haque MA et al [9], Alam K et al [7] who found male to female ratio as 3.5:1, 2.68: 1 and 2.4: 1 respectively.

The most common group of lymph nodes were cervical (47.49%) followed by submandibular (24.19%), axillary (9.74%) and supraclavicular (9.44%). Similar findings were observed by Bhargava P et al [10] and Alam K et al [7], with cervical lymph node involvement in 65.68% and 74.2% cases respectively. In our study inguinal lymph node involvement was (7.96%), similarly study done by K Alam et al [7] also found inguinal lymph node involvement in 4.97% cases. Malignant lymphoma mainly involved cervical nodes (48.14%). Similarly by Hehn ST et al [11] found 38% of cervical lymph nodes involved by malignant lymphoma. In our study metastatic malignancies involved most commonly cervical lymph nodes in 47.24% cases followed by submandibular group of lymph nodes in 24.91% cases. Similarly Alam K et al [7] found cervical lymph node as most commonly involved in 74.20% cases.

Out of 339 aspirates, 91.15% were diagnosed as metastatic lymphadenopathy and 7.96% were lymphoma and 0.88% were hematolymphoid malignancy. Similarly study done by Alam K et al [7], in which 80.4% were metastatic tumors of lymph node and 15.3% cases were of lymphoma. Metastatic involvement by squamous cell carcinoma was (59.98%) followed by undifferentiated epithelial malignancy in (19.17%). Comparable findings were noted by Alam K et al [7] found 67.87% cases of metastatic squamous cell carcinoma, followed by 11.31% cases of metastatic IDC breast. Bagwan IN et al [13] found 36.81% cases of metastatic squamous cell carcinoma, followed by 12.18% cases of undifferentiated epithelial malignancy. In our study 7.97% cases were of lymphoma. Gupta AK et al [14] and Bhaskaran CS et al [15], who found incidence as 2.78% and 2.98% respectively. There were 9 cases of Hodgkin's lymphoma, in which the majority of patients were young, 6 cases were below 40 years of age. Males outnumbered females with male to female ratio of 1.25:1. Cervical lymph node involvement was the commonest. Das DK et al [16] who studied 116 cases of Hodgkin's Lymphoma have also reported similar findings with male preponderance (M:F=6.7:1) and cervical lymphadenopathy as the commonest presentation. In our study among lymphoma group, 18 cases of NHL were diagnosed on cytology. Maximum cases were between 51-60 years of age with the age range being 11- 68 years and males were more frequently affected (M: F=2.6: 1). Our results match with those of Daskalopoulou D et al [17] who studied 164 lymph node aspirates from 132 patients of Non- Hodgkin's lymphoma. An age range of 5- 86 years along with a male preponderance (M:F=2:1). Leukemic lymphadenopathies are usually rare in occurrence, so as in our study with 0.88% incidence. In our study, out of 3 cases, one 61 year old male patient, and other 81 year old male patient, known case of CML in blast crisis had cervical and inguinal lymphadenopathy respectively. Kumar PV et al [18] have elucidated the difficulties in distinguishing leukemic infiltration of lymph nodes from lymphomatous involvement only on FNA smears.

In this study, metastatic malignancy (91.15%) with male predominance having M: F ratio was 2.36:1 and maximum cases were in 5th decade. Gupta AK et al [14] and Cervin JR et al [19] have observed similar findings. Alam K et al [7] also found 80.4% cases of metastatic malignant lymphadenopathies in their study.

Metastatic squamous cell carcinoma (65.37%) formed bulk of the lesions, followed by metastatic undifferentiated epithelial malignancies (21.03%).

Similarly Konar K et al [20] and Alam K et al [7] found 83.83% and 67.9% cases of metastatic squamous cell carcinoma respectively. The maximum aspirations were done from cervical lymph nodes (47.24%) followed by sub-mandibular (24.92%). Similarly Alam K et al [7] and Dhingra V et al [21] also found cervical lymph node to be most commonly involved in 74.2% and 79% cases respectively.

There were 65 cases (21.03%) of metastatic undifferentiated epithelial malignancy. Bagwan IN et al [13] and Alam K et al [7] found 12.18% and 4.07% cases of metastatic undifferentiated epithelial malignancy. Out of 309 cases of metastatic lesions, 8 cases (2.59%) were of metastatic adenocarcinoma. Alam K et al [7] and Bagwan IN et al [13] found 9.04% and 0.73% cases of metastatic adenocarcinoma respectively. Supraclavicular (4/8) and inguinal (2/8) lymph nodes were commonly involved owing to predominance of primaries from GIT. Similar findings reported by Sinha SK et al [22], who observed that malignancy of GIT and ovary most frequently metastasize to supraclavicular and inguinal lymph node.

Out of 309 cases of metastatic lesions, 20 cases (6.47%) were of metastatic infiltrating duct carcinoma of breast. Study by Alam K et al [7] comprised 11.31% cases of metastatic infiltrating duct carcinoma of breast. Most common group of lymph nodes involved were axillary group of lymph nodes seen in 17/ 20 cases, followed by supraclavicular lymph node in 2 cases. Pilloti S et al [23] and Sinha SK et al [22] have observed that axillary lymph nodes were most frequently involved in case of metastatic Ca of breast.

Out of 309 cases, 7 cases (2.06%) of metastatic thyroid carcinoma were observed. Cervical lymph nodes were involved in 5/7 cases and supraclavicular lymph nodes in 2/7 cases. Similarly Alam K et al [7] found 4 cases (1.80%) of metastatic thyroid carcinoma.

In our study, 3 cases (0.97%) were of metastatic malignant melanoma. Similarly Alam K et al [7] found 2 cases (0.90%) of metastatic malignant melanoma in their study. Inguinal lymph nodes were involved in 2 cases and cervical lymph node was involved in 1 case. Pilloti S et al [23] detected 16 cases of melanoma metastatic to axillary nodes.

There were 2 cases (0.65%) of metastatic renal cell carcinoma. In both cases, suparclavicular lymph node involvement was seen. Fernandes H et al [24] found single case of renal cell carcinoma, which was metastasizing to axillary lymph nodes. There was one case of round cell tumor (0.32%) who presented with bilateral cervical lymphadenopathy. Alam K et al [7] found 3 cases (1.35%) of round cell tumor. One case (0.32%) was seen, which was a known case of nasopharyngeal carcinoma. FNAC helped in confirmation of metastasis to anterior cervical lymph node. The findings were comparable to study done by Alam K et al [7], who found one case (0.45%) of metastatic nasopharyngeal carcinoma in their study.

Conclusion

Fine Needle Aspiration Cytology is logical extension of the more formalized biopsy procedure, lending itself to saving of time and cost and is convenient for both patients and physician in the management and follow up of malignant lymphadenopathies. FNAC helps in defining the tumor type, while the clinical history and investigations help in identifying the tumor site.

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Original Article

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Study of Paediatric Autopsies: An Endeavour to Improve Clinical Care in Rural Settings

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Abstract

Background: To know why India has failed to achieve Millennium Development Goal (MDG) 4. This aims at reducing U5MR by two- third between 1990-2015. *Aim*: To know the cause of paediatric death in North Maharashtra (Khandesh region) with 70% of Rural population. Measures to be taken to achieve MDG 4. To achieve clinico-pathological correlation in the cause of paediatric death. *Material and Methods*: A total of 124 cases were received for histopathological examination in the period of three year span from January 2014 to December 2016. 4 cases were completely autolysed. Hence 120 cases were included in the study. 9.6% cases belonged to neonatal age group, in whom perinatal asphyxia was the common cause. 15.3% belonged to infant and 71.7% belonged to childhood deaths. In both the age group, infection 78% was the main cause of death. On clinical correlation 16.6% discrepancy was present in neonate, 5.2% in infant and 4.4% in childhood. Medico-legal cases were seen in adolescent age group. *Results*: Prolonged labour and home delivery was the reason for perinatal asphyxia, which was the main cause of perinatal death in our study. Hence a good obstetric care in primary health centre along with educating mother is need in rural India. Effective intervention will be helpful in decreasing the mortality due to infection in infant and childhood deaths. Educating teenagers for hormonal changes is important in rural area too. Thus an autopsy study of paediatric deaths is informative and it can form baseline information for Promise of Renewal Movement.

Keyword: Millennium Development Goal (MDG) 4.

Introduction

Autopsy has traditionally been considered as a means in determining the cause of death. It plays a major role in medical care [1]. It helps us to improve our health services. Hence the present study was undertaken to know the cause of Pediatric deaths occurring in North Maharashtra (Khandesh region). This region has 70% of its total population living in rural areas and it is an endemic zone for sickle cell anaemia.

The present study will help us to know the causes of paediatric death in rural population. How it differs from urban population? Why the Under five mortality rate (U5MR) of rural Maharashtra (per 1000 live birth) is 18? Why India has failed to achieve Millennium Development Goal (MDG) 4, which aims at reducing U5MR by two-third between 1990-2015 [2]. In this study we have also included medicolegal cases, which had cost the child's life. Any discrepancy between antemortem and post mortem diagnosis was evaluated wherever possible.

Materials and Method

Our Department is the centre for histopathological examination of autopsies done in various health centres of North Maharashtra Khandesh region. Autopsies done in our institute are also received for histopathological study.

Tissues from Lungs, Liver, Spleen, Kidneys, and Brain along with whole heart are received in 10% formalin. The specimens are accompanied by clinical history and Post Mortem report.

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Grossing of the tissues is done in the department. The whole heart is studied for congenital anomalies. Paraffin embedded tissue sections are cut and stained with haematoxylin and eosin. Special stains like PAS stain, Ziehl- Neelsen stain are done wherever needed.

Retrospective studies of 124 Pediatric autopsies received in 3 year span from January 2014- December 2016 were studied. Autopsies of Day 1 to 18 years of age were included in the study. The histopathological slides along with clinical and post mortem findings were reviewed by three pathologists. Clinico-Pathological correlation was done to arrive at the cause of death, according to the availability of data.

Results

During the three years span, we received a total of 1194 cases of autopsies for histopathological examination, out of which 124(10.3%) cases were paediatric autopsies. The organs of 4 cases were received completely autolysed. Hence 120 cases were included in the study.

There were 12 (9.6%) cases which belonged to neonatal age group, 19 (15.3%) cases of infant age group and 89 (71.7%) cases of childhood deaths. The sex distribution was 74 males and 46 females.

The common cause in neonatal death (Table 1) was perinatal Asphyxia 4 cases (33.3%).The cause of perinatal asphyxia in 2 cases was prolonged labour and home delivery, while there was history of eclampsia in one case and meconium aspiration (Figure 1) in other case.

The premature cases showed diffuse alveolar damage along with hyaline membrane formation. Pneumonia (Figure 2) was diagnosed, while neonatal hepatitis was missed clinically. There was a case of Persistent truncus arteriosus, which was impossible to diagnose clinically due to rural setting. Thus the discrepancy between ante-mortem and post-mortem diagnosis in neonate was seen in two cases (16.6%). In one case there were no abnormal findings detected on histopathology, while in medico legal case, it was an assault by drunken father.

In Infant (Table 2), maximum i.e. 15 cases (78%) were of infective etiology, lower respiratory tract 13 cases (67.5%) dominated the list. The clinical details available were high grade fever. Three cases presented with sudden unexpected infant death. On histopathological examination one case showed vaso-occlusive sickle cell crisis, while in two cases no abnormalities were seen. Patient of Niemann Pick disease was admitted for hepatic encephalopathy. In Infant too discrepancy was seen in two cases (5.2%).

There were 89 cases (71.7%) of childhood deaths (Table 3). There was good clinical correlation in all infective cases (70 cases), as well as in Nutritional anaemia, sickle cell crisis and Leukaemia (Figure 3 and 4). A case of Guillain- Barre syndrome and Rabies showed classic presentation clinically. However on histopathology it was difficult to prove because of inadequate sample. Eosinophilic pneumonia was an incidental finding. Diffuse alveolar damage along with Aspergillosis was seen in bed ridden patient with surgical complication. Thus the discrepancy was seen in four cases (4.4%).

Table 1: Causes of Neonatal (birth to 1 month) death (N= 12)

Causes of Death	No. of Deaths	%
Perinatal asphyxia	4	33.3%
Prematurity	2	16.6%
Pneumonia	2	16.6%
Neonatal hepatitis	1	.3%
Persistent truncus arteriosus	1	8.3%
Cause unknown	1	8.3%
MLC	1	8.3%
Total	12	100%

Table 2: Causes of Infant (month to 1 year) deaths (N= 19)

Causes of Death	No. of Deaths	%
Infective	15	78%
Pneumonia	11	57%
Interstitial pneumonia	2	10.5%
Meningitis	2	10.5%
Sickle cell crisis	1	5.2%
Niemann Pick disease	1	5.2%
Cause not known	2	10.5%
Total	19	100%

Table 3: Causes of childhood (2-18 years) deaths (N= 89)

Causes of Death	No. of Deaths	%
Infective	70	78%
Pneumonia	40	44.9%
Interstitial pneumonia	14	15%
Meningitis	8	8.9%
Pulmonary Tuberculosis	3	3.3%
Acute gastroenteritis	2	2.2%
Hepatitis	1	1.1%
Typhoid	1	1.1%
Cerebral Malaria	1	1.1%
Sickle cell crisis	3	3.3%
Nutritional anaemia	2	2.2%
Leukaemia	2	2.2%
Eosinophilic pneumonia	1	1.1%
Diffuse alveolar damage with Aspergillosis	1	1.1%
Rabies	1	1.1%
Guillain- Barre syndrome	1	1.1%
Medico legal cases	6	6.7%
Cause not Known	2	1.1%
Total	89	100%

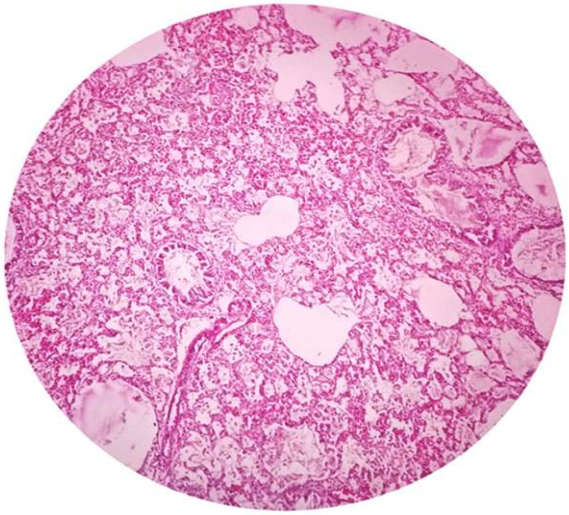

Fig. 1: H&E 10X Lung alveoli showing squames in meconium aspirate

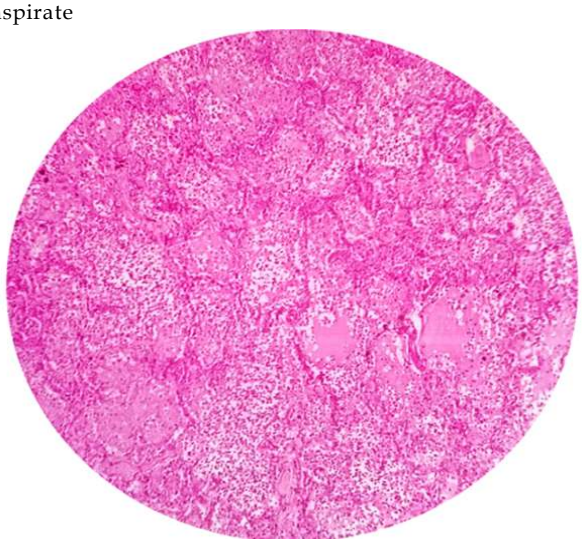

Fig. 2: H&E 10X Lung showing lobar pneumonia

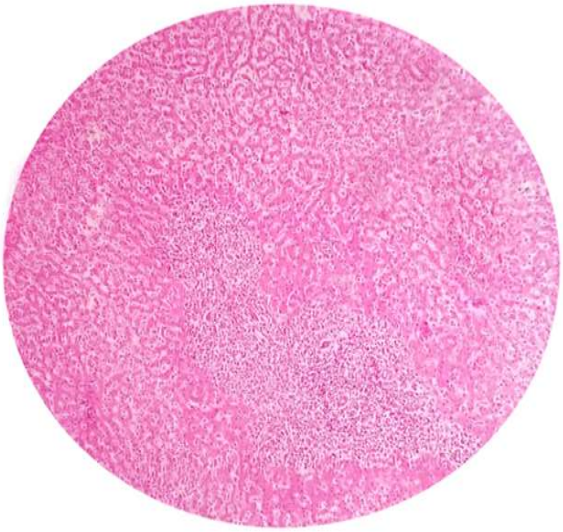

Fig. 3: H&E 10X Liver showing leukemic infiltrate

There were six medicolegal case, two cases were adolescent females with history of hanging, the remaining three cases were of burn injury due to fire cracker, snake bite, quarrel among friends leading to subdural haematoma respectively. All the cases were seen in males of adolescent age group. In two cases histopathology was not helpful in arriving at diagnosis.

Discussion

Most of the studies which were done in the past were focussed on neonate and Infant deaths. Very few studies have dealt with childhood deaths along

with adolescent deaths and their problems. The previous studies were done in urban institutes. These prompted us to undertake the present study, where 70% of total population of Khandesh region resides in rural area and are of tribal origin. The present study is a composite study of paediatric age group from neonate to adolescent age.

12(9.6%) cases were received of neonates. The common causes of deaths were perinatal asphyxia (33.3%), prematurity (16.6%) and infections (16.6%). According to the latest sample registration system [3] report Prematurity and low birth weight were the main causes of deaths followed by neonatal infections and birth asphyxia. There is marked regional variations in the leading causes of deaths across India. In central India Perinatal asphyxia and prematurity were the main causes of deaths [4]. In urban areas congenital anomalies contributes in larger proportion to neonatal causes of deaths than rural regions [5].

The cause of perinatal asphyxia in our study was due to prolonged labour and home delivery. Complications during labour and delivery are responsible for approximately a quarter of all deaths worldwide [6]. Lack of transport facilities in rural and remote areas are the major drawbacks in accessing antenatal services and emergency obstetric care in India [7,8]. Thus a good emergency care should be easily accessible and should be able to treat the complications at primary health centres. Even if such facilities are available, there is delay in seeking care due to ignorance and illiteracy [9]. Thus educating mother is a dire need in reducing neonatal mortality.

78% of infant and childhood deaths were due to infections. In both the age groups pneumonia 57% in infant and 44.9% in childhood was the main cause this was followed by interstitial pneumonia in both the age groups. According to National representative mortality survey in India [4], 50% of deaths at 1-59 months were due to pneumonia and diarrhoea. Pneumonia was the common cause in our study; however diarrhoea was not the common cause. This may be due to limitation of our study, when the cause of death is certain it is not sent for histopathological examinations. Secondly histopathological examination is not useful in determining the causes of diarrhoea.

There were 3 (2.5%) cases, 2 (infant) and 1 (neonate) which showed no abnormal findings at autopsy. While Chittralekha P in her study of perinatal autopsy was unable to derive the cause of death in 9% of cases [10]. Failure to determine the cause of death may be due to autopsy not done by pathologist, or limitations of autopsy. The cause in these cases may be either metabolic cause or sudden unexpected death in infancy. According to M A Weber [11] in his study in determining the cause of sudden unexpected death in infancy, has concluded that identifiable specific cause of death can be established in only one third of cases even if the autopsies are done by paediatric pathologist with currently suggested guidelines.

Sickle cell gene is widely spread in all districts of North Maharashtra (satpuda range) [12]. We had 4 cases (1 infant and 3 childhood deaths) of sickle cell crisis. The infant was 9 month old belonged to Pawara tribal group. While the age of remaining children ranged from 6 to 13 years. They were diagnosed cases of sickle cell trait and belonged to Bhil community. The prevalence of sickle cell disease is very high among the Bhil and Pawara group [13]. The preceeding symptoms in children were fever, body ache (which may be joint pain). Extensive clinical study by Kar B C et al [14] noted that attack of pain; fever and anaemia were the predominant presenting features. In all the 4 cases capillaries of all the organs showed occlusion by sickle RBCS. Hence the terminal cause of death was put forward is vaso occlusive sickle cell crisis. Similar findings were seen by following authors too [15,16].

In medicolegal cases, death of neonate is self explanatory of ill effects of alcoholism. In adolescent age suicidal cases in females is due to sudden emotional nature which can occur due to hormonal changes [17].Thus sex education is a must in adolescent age.

Burn injury and assault can be explained by adventurous and rebellious nature seen in adolescent age group. Snake bite in farm is responsible for death of young and working population of our country. Thus an immense responsibility lies with parents to prevent such childhood deaths.

Conclusions

This retrospective autopsy study is done on moderate tissues received for histopathological examination. It lacks in situ and gross examinations done while performing the autopsy. However the findings presented in this review, provides us the burden of child deaths in rural India. It has helped us to identify causes of child deaths. Most of the causes are preventable and there are known cost effective interventions.

The present study will help us to achieve "A

PROMISE RENEWED" a global movement to end preventable child deaths by accelerating progress on maternal, newborn and child survival.

Acknowledgement

Special thanks to our technicians working in autopsy section Mr. S.A. Khairnar and Mr. Suryawanshi, for making the documents and slides available for review without any grudge.

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Case Report

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Body Packer Masquerading as a Medical Tourist

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Abstract

Drug trafficking is an international problem and has increased in prevalence and concealment methods over the years. Body packers either swallow drug-filled packets or introduce packets into their bodies rectally or vaginally with the purpose of concealing them and mainly smuggle cocaine, heroin and cannabis products. Increased sophistication of traffickers and improved packaging poses difficulty in detection. Sometimes the packets can leak and cause intoxication of the individual and even death. We report a case of death due to heroin leakage in a body packer, attempting to smuggle the drug by concealing it in his stomach. This article aims to highlight the existence of drug traffickers as Body packers so that preventive steps may be taken at the points of transit from other countries as they may be masquerading as Medical tourists, coming to India for treatment.

Keywords: Drug Trafficking; Body Packer; Heroin; Cocaine; Medical Tourist; Drug Intoxication.

Introduction

Drug trafficking is the most serious organized crime and illicit trade affecting the humanity globally and also is continuously monitored by United Nations Office on Drugs and Crime [1]. It has increased in prevalence over years and stringent laws and strict security measures have lead to evolving of newer and unique concealment methods to hide them from security personnel while transporting from one place to other in airports, railway stations, naval docks or border areas. Body packing is one such method, where the drug trafficker swallows wrapped packets of illicit drugs in one country andtransports the same to the other country where the drugs are retrieved from vomitus or faeces. For this purpose, the drug is usually compressed into cylinders; heat sealed in plastic film, and wrapped in multiple layers of latex—perhaps balloons, capsules, condoms, balloons, or fingers of rubber gloves [2-5]. The individuals carrying these packets may present to health care providers with symptoms of intoxication or asymptomatically on suspicion of drug concealment for observation and occasionally the occurrence of body packing is detected only during autopsy. Packet failure may occur in country of origin, during flight or at their destination and they may succumb to the effects of illicit drug poisoning.

First case of body packer was reported in 1973, as condom filled hashish, presenting with small bowel obstruction [6]. Since then, a few case reports and retrospective observational studies have been reported [7,8]. Trafficking is also highly prevalent in India, but, very few body packer syndromes are reported in literature, two with cocaine [9,10], one with heroin [8] and one with cannabis [11]. The authors report one such case of body packing, where the deceased was presented as natural death but autopsy of deceased and would have gone undetected if the packets would not have been found during the autopsy.

Case Details

A case of 55 year old male Afghan national was

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brought for autopsy in the Department of Forensic Medicine, All India Institute of Medical Sciences (AIIMS), New Delhi. As per the history provided by the relatives to the police, the deceased had come to India from Afghanistan for Medical Treatment. They alleged that his Medical records were lost at the airport and allegedly died a natural death on the 4th day of his arrival at their home in Delhi. They approached the Afghanistan Embassy to get a No Objection Certificate to transport the body to Afghanistan but The Embassy refused and asked the death to be medically certified and get a police clearance. The relatives then approached the police who subjected the body for Postmortem examination.

The autopsy was conducted on the 4th day from the date of alleged death. The deceased was of medium built. Rigor Mortis had passed off and there was greenish discoloration of lower abdomen. No evidence of any injury or intravenous line or scar was found on the body. No external injury was present over the body. The Natural Orifices were normal. On internal examination, Blackish brown fluid was present in trachea. Heart weighed 302 gram and had variable degree of atherosclerotic changes with luminal blockade of all major coronary vessels.

Stomach contained about 250ml of dark brownish black colored fluid (Figure 1). There were toffee

Fig. 1: Darkish Brown Fluid in Stomach

Fig. 2: Polythene pellets recovered from Stomach

shaped Polythene capsules, which were cylindrical in shape. There were forty seven such capsules; forty six were intact, while the contents of one packet had leaked out (Figure 2). The packets contained white colored material inside. Their size varied from 4.1—4.5 cm in length, and weight was approximately 8.5—9.3 grams. The total weight of all the packets was 422 grams. Mucosa of stomach and duodenum was congested. There was no evidence of any intestinal obstruction. No similar Polythene packets were found in small intestine and large intestine up to rectum. The other internal organs were congested. The packets were subjected to preliminary toxicological analysis in the Departmental Toxicology Lab which revealed presence of diacetyl morphine in the urine of the deceased indicative of Heroine intoxication.

Discussion

The underlying reason for the body packers to conceal narcotics for trafficking needs to be introspected. Heroin and Cocaine are both very expensive drugs, consumed worldwide, with a large clientele. Consumption of these drugs in very small amounts produces the desired effects. So, trafficking these drugs are economically very lucrative, as only few Kilograms of Cocaine or Heroin can be peddled easily, and the net worth of the drugs are around few Crores of rupees. Due to stringent rules and strict punishments, transport of narcotics especially across international borders has become very difficult in the recent past. Thus, the drug peddlers have resorted to unique methods of drug trafficking, body packing being one of them.

Body packers, pushers and stuffers are three different categories: body packers (also known as swallowers, internal carriers, couriers or mules) ingest wrapped packets containing illicit drugs for smuggling across borders; body pushers insert the packets into rectum or vagina with same purpose while body stuffers (also known as mini-packers) without smuggling intention ingests poorly wrapped drugs to conceal its presence to avoid getting arrested [12,13].

Body packer syndrome should be suspected by emergency physician in any international traveler with features of toxicity, unconsciousness, seizures and sudden death [14]. They may present with intestinal obstruction, perforation, hemorrhage or for medical assessment after detection/arrest. Normally the carriers were used to be mostly young men but nowadays children, pregnant women and even

patients also traffic drugs [14]. The body packer in the present case was a fifty five year old male and was visiting to India for Medical Tourism.

There are no specific gold standard criteria for diagnosing Body packers. Detailed history and complete examination are an essential part but history may not be reliable, due to false or partial information provided in fear of prosecution, communication problems and altered sensorium of patients [15]. In our case also the patient was alleged to have died due to natural cause. Whole body examination must be done in suspected body packers/pushers/stuffers, and all natural orifices should be thoroughly examined [12]. X-ray of abdomen may show multiple radio dense foreign bodies, a "rosette-like finding" formed by air trapped in the knot where a condom is tied and a "double-condom" sign, where air trapped between layers of latex makes them more visible. Barium enhanced radiography and CECT scan can help in diagnosis as well as assessment of response to treatment [16]. The packers usually carry 1-2 kg of drug, divided into 50-100 packets, of 8-10 gm each, although person carrying 200 packets have also been described [13]. In the present case, the body packer was carrying forty seven (47) packets, each weighing 8.5—9.3 grams and the total weight was 422 grams.

The drug packets have been classified into the following three types: type I packets—small size with thin wrapping and high chance of rupturing; type II packets—medium quality wrapping fixed with knot with a low chance of rupturing and type III packets with good quality packing with several layers of latex wrapping fixed with paraffin or wax and with very low chance of rupturing [17]. Poorly packaged pellets may get unwrapped inside the gastrointestinal tract due to mechanical turbulence and chemical digestion [18]. In a study about 50 body packers in New York City (1990-2001) the authors observed that majority (74%) of deaths were due to acute intoxications because of bursting or leakage of drug packets in the gastrointestinal tract [19]. In the present case also, the intoxication and death occurred due to leakage from the partially opened packet. So, when a foreigner is found dead in a hotel, the entire alimentary canal should be dissected and the anal canal should also be searched to look for a leaking package filled with narcotics [20]. There are some reports about death from intestinal obstruction and perforation in heroin body packers [21] and also upper GI hemorrhage due to prolonged pressure of the packets on the gastric mucosa [22]. In a case of a package leaked Methyl Amphetamine body packer, autopsy findings showed extreme pulmonary congestion and edema as well as moderate hepatic edema and several petechiae [23]. In the present case, mucosa of stomach and duodenum were congested. There was no evidence of any intestinal obstruction and no other Polythene packets were found in small intestine and large intestine up to rectum. All internal organs were congested and there was pulmonary edema as well.

There are no actual data on body packers in India, and only few occasional cases have been reported. Similar instances of death of body packers due to concealment of drugs have been previously reported from Delhi, in the past from AIIMS, New Delhi [10] and very recently from VMMC & Safdarjung hospital [24].

Conclusion

This article aims to bring to attention the fact that inspite of strict law enforcing measures, drug trafficking by Body packers still remains an effective mode of cross border drug peddling in a developing country like India. A careful autopsy of suspected body packers may reveal comprehensive data about packaging methods, exact number of packets, and type of the transported illicit drug and location of the packets in the body. We are reporting this case to highlight the existence of drug traffickers, so that preventive steps may be taken at the points of transit from another country as a drug traffickers may be masquerading as Medical tourists, coming to India for treatment.

Conflict of Interest: None

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Case Report

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Hepatocellular Carcinoma- Sarcomatoid Variant: A Rare Occurence

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Abstract

Background: Primary liver cancer is the second most common cancer in Asia, hepatocellular carcinoma being the most common histological type. Hepatocellular carcinoma with sarcomatoid features and osteoclast like giant cells is a rare malignancy and has higher risk of metastasis as compared to usual Hepatocellular carcinoma. *Case Description:* We recently encountered an autopsy case of cirrhotic liver with sarcomatoid variant of Hepatocellular carcinoma in a 59 year old male. Macroscopically, it presented as a grey white to grey yellow ill defined nodule with central necrosis and surrounding micronodular cirrhotic changes. Microscopically, tumor predominantly composed of two cell types were noticed- classical hepatocellular carcinoma with atypical hepatocytes and pleomorphic spindle cells with frequent mitosis and multinucleated giant cells. As the tumor had both epithelial and mesenchymal differentiation in the same lesion, the diagnosis of sarcomatoid variant of hepatocellular carcinoma was made. *Literature Review*: Sarcomatoid variant of carcinoma has to have both epithelial and mesenchymal differentiation in the same lesion. Occasionally when the tumor is fully composed of malignant spindle cells, it is difficult to distinguish from various primary sarcoma and has to be confirmed by immunohistochemical staining Clinical relevance: The prognosis of the sarcomatoid variant of Hepatocellular carcinoma is unfavourable compared with classical Hepatocellular carcinoma which could be attributed to aggressive intrahepatic spreading and frequent metastasis. Histopathological study is the only effective diagnostic tool for confirmation.

Keywords: Hepatocellular Carcinoma; Sarcomatoid; Osteoclast Like Giant Cells.

Introduction

Primary liver cancer is the second most common cancer in Asia, hepatocellular carcinoma being the most common histological type [1]. Sarcomatoid variant of Hepatocellular Carcinoma is a rare variant comprised of malignant spindle cells in varying proportions. In the liver, the incidence of spindle cell HCC has been found in only 1.8% of surgically resected HCCs and 3.9-9.4% of autopsy cases of HCC [2]. When such sarcomatoid features are prominent, the tumour is called Sarcomatoid HCC.

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The 2010 World Health Organisation classification of gastrointestinal tumors classifies Sarcomatoid HCC under special types of carcinoma [1]. They have been reported in many organs including the esophagus, upper aerodigestive tract, thyroid, uterus, lung, breast, stomach and gall bladder [2].

Here we report a recent case of sarcomatoid HCC in an autopsy specimen with review of relevant literature.

Case Report

A 59 year old male patient was admitted to the hospital with complaints of abdominal distension, epigastric discomfort, pedal edema since one month. He was a chronic smoker and alcoholic for past 30years. On examination, abdominal distension with bilateral pedal edema was noted. Shifting dullness was present. Organomegaly could not be

appreciated.

Laboratory test results were as follows: Hb%- 10.8g%, PCV-31.6%, Total protein- 7.4g/dl, Serum albumin- 2.6g/dl, Total bilirubin-5.8mg/dl, Direct bilirubin-2.6mg/dl, SGOT, SGPT, ALP- within normal limits.

Urea and Serum creatinine were slightly above the normal range. However, CECT KUB revealed no detectable abnormalities.

The viral markers for Hepatitis B and Hepatitis C were not done.

Utrasound abdomen showed cirrhotic liver with ill defined heterogenous lesion involving the right lobe of liver measuring 5.8 x 5cm, suspicious of Hepatocellular Carcinoma. Portal venous thrombosis and splenomegaly were the other notable findings that were detected.

Patient expired before other investigations could be done and was sent for autopsy examination. It revealed 1.5litres of ascitic fluid in the peritoneum with cirrhotic changes in the liver. Also an ill defined nodule was noted in the right lobe of the liver. The specimen was then sent to the laboratory for histopathological examination.

Pathological Findings

The specimen was sent in 3 pieces, largest piece measuring 12x8x2.5cm contained an ill defined nodule measuring 5.5 x 4.5cm. Cut section of the nodule showed non encapsulated expansile grey-yellow to grey white solid mass with central necrosis (Figure 1). Surrounding non tumorous liver showed micronodular cirrhotic changes.

Microscopically, two tumour cell types were seen. One area showing features of classical hepatocellular carcinoma with atypical hepatocytes arranged in sheets and microtrabecular pattern. These cells have increased nucleo cytoplasmic ratio, large pleomorphic hyperchromatic nuclei, few of them showing prominent nucleoli with moderate to abundant granular eosinophilic cytoplasm. Edmonson-Steiner's nuclear grade of grade III was considered (Figure 2).

Other area exhibited sarcomatoid pattern of growth where malignant spindle cells are arranged in syncitial sheets and storiform pattern. These cells have large irregular vesicular nucleus, large prominent nucleoli (Figure 3). Numerous atypical mitotic figures and osteoclast like giant cells were seen (Figure 4). Surrounding area showed extensive necrosis, fibrous stroma showing hyalinization at places, chronic inflammatory cell infiltrate and congested blood vessels.

Sections studied from tumor free liver parenchyma showed marked chronic periportal hepatitis and moderate fibrosis.

Discussion

Fig. 1: Ill defined macronodule measuring 5.5x4.5cm with extensive central necrosis

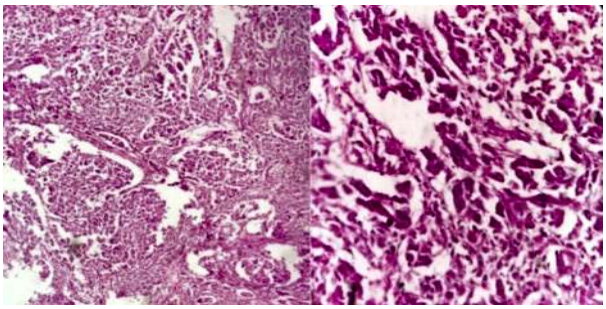

Fig. 2: Tumor cells showing classical variant of Hepatocellular carcinoma

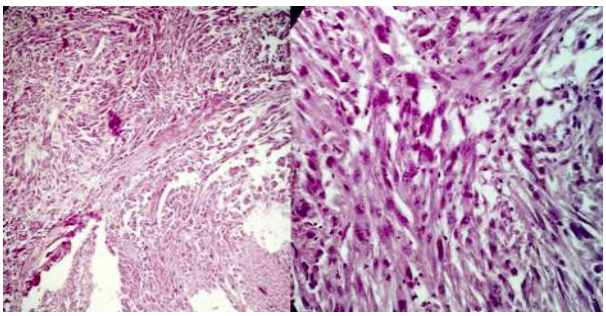

Fig. 3: Tumor cells showing spindle cell differentiation

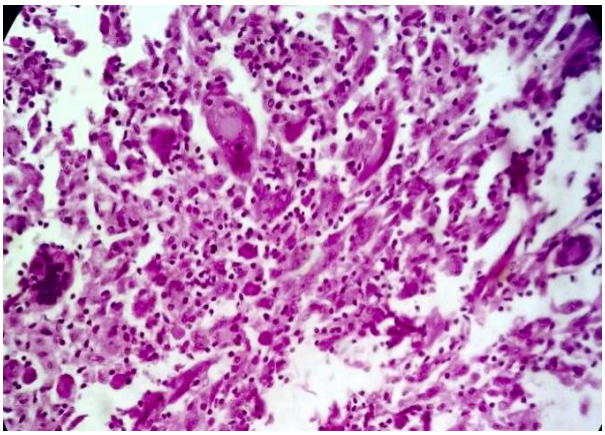

Fig. 4: Osteoclast like giant cells

Carcinomas with spindle cell components are unusual neoplasms and have been referred to using various terms such as spindle cell carcinoma, sarcomatoid carcinoma, pseudosarcoma and carcinosarcoma. Clinically, HCCs with sarcomatous appearance do not differ from ordinary HCC in incidence regarding age and sex distribution [1].

By definition, the sarcomatoid variant of carcinoma has to have both epithelial and mesenchymal differentiation in the same lesion [3]. Occasionally when the tumor is fully composed of malignant spindle cells, it is difficult to distinguish from various primary sarcoma and has to be confirmed by immunohistochemical staining. However considering the rarity of these tumours and paucity of literature, whether a sarcomatous component with specific lineage will influence the clinical course remains unclear [3].

The pathogenesis of the sarcomatoid appearance of hepatic carcinoma has not been thoroughly studied. Several hypotheses have been reported in the literature that includes: 1) transdifferentiation or dedifferentiation from the original carcinoma cells, 2) biphasic differentiation from pluripotent stem cells, 3) metaplastic process of carcinoma, and 4) redifferentiation of immature multipotent carcinoma cells transformed from carci-noma cells [3].

Literature also suggests that sarcomatoid change is more frequent in HCC with repeated chemotherapy or transarterial chemoembolisation [1]. However in this case, patient had not received any treatment and hence that possibility can be safely ruled out.

Sarcomatoid HCC with multinucleated giant cells is a rare occurrence. It has been reported in various other organs including pancreas, thyroid, lung, breast and salivary glands. These osteoclastic giant cells are considered reactive histiocytic cells rather than true malignant tumor cells [4].

The prognosis of the sarcomatoid variant of HCC is unfavourable compared with classical HCC which could be attributed to aggressive intrahepatic spreading and frequent metastasis [3]. Histopathological study is the only effective diagnostic tool for confirmation.

The present sarcomatoid hepatocellular carcinoma with osteoclast-like giant cells is a rare tumor of the liver. These tumors have areas of classic liver cell carcinoma and a sarcomatous tumor with multiple osteoclast like giant cells. Analogous features might be observed in similar tumors from different sites. As sarcomatoid variant of HCC has unfavourable prognosis, histopathological confirmation of diagnosis plays an important role in further management.

Abbreviations

HCC: Hepatocellular carcinoma

CECT-KUB: Contrast enhanced computerized tomography- Kidney Ureter Bladder

SGOT: Serum glutamic oxaloacetic transaminase

SGPT: Serum glutamic pyruvic transaminase

ALP: Alkaline phosphatase

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Corporate (collective) author

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Reference from electronic media

[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979-2001. www.statistics.gov.uk/downloads/theme_health/HSQ 20.pdf (accessed Jan 24, 2005): 7-18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

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