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Problem Based Learning versus Traditional Lecture Method: A Comparative Study among Second Year Medical Students

Mane Manisha*, Kadu Aniruddha**, Preeti Bajaj***

Abstract

Background: The medical curriculum in most colleges is taught in a traditional, subject-wise fashion predominantly through didactic lectures. PBL is an effective way of delivering medical education in a coherent, integrated manner. **Aim and Objectives:** To compare PBL with traditional learning method. **Type of Study:** comparative study. **Materials & Method:** 96 medical students from Dr. Vasant Rao Pawar medical college, Nashik were recruited during second term of their second year. Ten topics from the 2nd term syllabus of second year were selected. Out of these 10 topics, 5 were covered under PBL method and remaining under traditional lectures. For PBL sessions, all students were grouped into 12, with each group consisting of 8 students. At the end of study, prestructured and pretested questionnaire consisting of items pertaining to the process of PBL was filled from students and also performance of students was assessed in post session examination. **Results:** Out of the 96 students, 84(87.5%), 87(90.6%) and 75(78.13%) students said PBL increased their motivation to participate in class, to attend class and to do well in the course respectively. Also, 90 (93.75%) students said that PBL enhanced their communication skills and 88(91.67%) students said that PBL has enhanced their retention of course content. In PBL Covered Topics, 68.75% students scored above e"75% while in Traditional Lecture Covered Topics, 44.79% students scored e"75%. Average attendance in PBL session was 89.79% while in traditional lecture method it was 78.95%. **Conclusion:** In institute with packed curriculum, introducing more PBL sessions is not feasible as it is time consuming, though it is more effective method of learning. So the hybrid method i.e. combination of these two methods will be more effective than any of them alone.

Key Words: Problem based learning (PBL); Traditional teaching methods (lecture-based); Medical education; Integrated teaching.

Introduction

There is a growing concern among medical educators that conventional modes of teaching medical students (lecture-based curricula) neither encourage the right qualities in students nor imparts a life-long respect for learning. Fundamental reforms in undergraduate medical education have been advocated for 100 years. In 1899, Sir William Osler realised that the complexity of medicine had already progressed beyond the ability of the teachers to teach everything that students would need to know. This can be brought about only by freeing medical education from

some of its present rigidity and uniformity, by reducing classroom overcrowding, and by adapting medical education to more closely meet the educational needs of students [1].

The shift in emphasis from traditional teaching to an emerging method like Problem based learning (PBL) is largely triggered by the changing external environment that is the 'global' workplace for which institutions are preparing their students [2].

PBL is an effective way of delivering medical education in a coherent, integrated manner. It is based on principles of adult learning theory, including motivating the students, encouraging them to set their own learning goals, and giving them a role in decisions that affect their own learning [3].

Medical colleges in India have been following a traditional curriculum, characterized by "discipline wise model" with a high degree of compartmentalization into subjects of basic sciences, paraclinical and

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clinical branches. Several areas of redundancy, repetition and overlapping along with the observation of a gap between the qualitative and quantitative advancement in medical education and achievements in the field of health care prompted the Medical Council of India to adopt a need based curriculum for undergraduate medical education in India. "Regulations on Graduate Medical Education, 1997" recommend a teaching approach characterized by maximal efforts to encourage integrated teaching between traditional subject areas using a problem based learning approach and de-emphasize compartmentalization of disciplines so as to achieve both horizontal and vertical integration in different phases [4].

Switching to PBL requires teachers to alter their role from a didactic teacher to that of a facilitator. However, not many medical colleges in India have incorporated PBL as the sole or one of the teaching methods. This could be because of a lack of awareness regarding PBL or negative perceptions about the role of a teacher in PBL. Faculty development is crucial to the success of medical education programmes and must be a continuous process adapted to the needs of an educational environment and its teachers [5].

Therefore present study is conducted to compare old traditional teaching methods with PBL in view of introducing this new method in teaching curriculum.

What is traditional teaching and what is problem based learning?

The medical curriculum in most schools is taught in a traditional, subject-wise fashion predominantly through didactic lectures. Assessment continues to mainly test factual knowledge and recall [6].

In the conventional curriculum, teaching is tutor-centred and comprises large group lectures, tutorials, structured laboratory experience, and periodic tests of achievement. Students passively absorb information rather than actively acquire knowledge [1]. This is the problem solving method i.e. arriving at

decisions based on prior knowledge and reasoning. The focus is on preparatory learning prior to exposure to the problem. Learning environment is passive and teacher centred while PBL is self directed and student centred.

In problem based learning (PBL) students use "triggers" from the problem case or scenario to define their own learning objectives. Subsequently they do independent, self directed study before returning to the group to discuss and refine their acquired knowledge. Thus, PBL is not about problem solving per se, but rather it uses appropriate problems to increase knowledge and understanding. The process is clearly defined, and the several variations that exist all follow a similar series of steps [3].

Aim and Objectives

To compare the PBL with traditional learning method.

Materilas and methods

Type of Study

Comparative study

Study Period

The present study was carried out in December 2011 to June 2012.

Study Population

Ninety six students from second year of MBBS course from Dr. Vasantrao Pawar Medical College, Nasik.

Method

Ethical clearance from the institutional Ethical Committee was obtained and consent was taken from each participants. The participants were recruited during second term of their second year considering that they

have basic knowledge and good sensitization about the microbiology. 10 topics from the 2nd term syllabus of second year were selected. Out of these 10 topics, 5 were covered under PBL method and remaining under traditional lectures.

For PBL sessions, the total 96 students were grouped in to 12, with each group consisting of 8 students. In the 1st session all students have given some lectures and information related to the topic of interest. Afterwards all the groups have given same problem/scenario/case and they have asked to formulate their own hypothesis and learning objectives within their group after discussing and involving each member of the group. For this purpose they have given one hour.

Then students were given one weeks of preparation time for the presentation during which they were supposed to study all their learning objectives with the help of study material, references provided by the facilitator.

The next session was organised after one week and all the students were reviewed and encouraged to discuss the given scenario covering each and every aspect. The pre-structured and pre-tested questionnaire consisting of items pertaining to the process of PBL was designed, after an extensive literature review. This proforma was filled from the students. Also, the objective type of examination (50 marks) was conducted for the evaluation of the students at the end, which consist of two sections, section A (25 marks) & B (25 marks) based on the topics covered under PBL and traditional lecture method respectively. Analysis was done by using Z test.

Results

Table 1 shows the comparison of student's perception about PBL and traditional lecture method. When students were asked some questions pertaining to, how PBL impact motivational factors on which process of learning is dependant; like motivation to attend, participate and do well in the class.

Out of the 96 students, 84(87.5%), 87(90.6%) and 75(78.13%) students said PBL enhanced their motivation to participate in class, to attend classes and to do well in the course respectively whereas only 25(26.04%), 36(37.5%), and 43(44.79%) students gave corresponding response to these question in relation to traditional lecture method.

And the difference between the two methods was found to be statistically significant (Table-1).

While 90 (93.75%) students said that PBL enhanced their communication skills, compared to this only 21(21.88%) students had given response in favor of traditional lecture method. 88(91.67%) students said that PBL has enhanced their retention in-course content whereas 50(52.08%) said the same about traditional lecture. Regarding the understanding of course content, both the methods were equally effective as 82(85.42%) students identified PBL while 80(83.33%) students identified traditional lecture method as effective modality.

Table 2 shows Comparison of performance of students in post session examination. In section A (Based on PBL Covered Topics), 68.75% students scored above e"75% while in section B (Based on Traditional Lecture Covered Topics), 44.79% students scored e"75%. This difference was found to be statistically significant.

Table 3 shows comparison between attendance of students in PBL sessions and traditional lectures. Average attendance in PBL session was 89.79% while in traditional lecture method it was 78.95%. This difference in attendance was found to be statistically significant.

Discussion

PBL was chosen as an effective method to assist students in learning concepts of Microbiology course. After some didactic lectures were replaced by PBL sessions in a large classroom setting, it soon became

Table 1: Comparison of student's perception about PBL and the traditional lecture method

Questions	Students With The ‘Yes’ Response				Z Value	P Value
	PBL		Traditional lecture method			
	No of students (N=96)	%	No of students (N=96)	%		
Question 1. Increased my motivation to participate in class	84	87.5%	25	26.04%	10.96	<0.05
Question 2. Increased my motivation to attend class	87	90.6%	36	37.5%	9.20	<0.05
Question 3. Enhanced my communication skills	90	93.75%	21	21.88%	14.70	<0.05
Question4. Increased my motivation to do well in the course	75	78.13%	43	44.79%	5.05	<0.05
Question 5. Enhanced my retention of course content	88	91.67%	50	52.08%	6.79	<0.05
Question6. Increase my understanding of course content	82	85.42%	80	83.33%	0.40	>0.05

Table 2: Comparison of performance of students in post session examination

Marks Obtained	Section A (Based on PBL Covered Topics)		Section B (Based on Traditional Lecture Covered Topics)	
	No. of students	%	No. of students	%
= 75%	66	68.75%	43	44.79%
50 -74.9%	25	26.04%	41	42.71%
<50%	05	05.21%	12	12.50%
Total	96	100.00%	96	100.00%

(S.E.P. between section A & section B for $\geq 75\%$ marks obtained is $Z=3.45$, $P<0.05$)

Table 3: Comparison between attendance of students in PBL sessions and traditional lectures.

Type Of Session	Average Attendance (Out of 96 Students)	Attendance in Percentage
PBL	86.2	89.79 %
Traditional lecture method	75.8	78.95 %

(Z = 2.09, P < 0.05)

apparent that PBL was very popular with students. The PBL technique does not require additional tutors or any additional funding; therefore, the use of PBL could be expanded further. However, to do this, we need to demonstrate that this teaching technique in a classroom setting has benefits for student learning similar to conventional teaching method or that this technique is at least no inferior to conventional lecture-based learning. The main objectives of this study was to compare PBL with traditional lecture method in the form of

1. Student's perception about each of these
2. Comparison of post session examination results
3. Comparison of attendance

In the present study we found that PBL is more effective method than traditional lecture method, when the ability of the method to effect motivational aspect of learning was tested.

As PBL consist of groups with each consisting of only 8 students, each and every student got the chance to participate in discussion, so subsequently students found PBL learning method more retentive and it also improved their communication skill.

The present study showed that students found these both methods nearly equally effective in understanding the course content. Thus traditional teaching method was not inferior to PBL in understanding the course content.

Our results are consistent with a study conducted at the UBC Okanagan campus in Kelowna, BC, Canada by Andis Klegeris *et al* [7] within a pharmacology curriculum. They have found that students enjoyed PBL-based

programs more than conventional programs because of the enhanced learning benefits, including understanding and retention of the course materials.

In a similar study conducted by Maya Roche *et al* found that 79% students felt that PBL session motivated them to learn, 92.7% students found PBL method reinforcing their understanding of the subject and 83.9% students felt that PBL facilitates team learning [8].

As shown in table no 2, significantly more students performed well in PBL covered topics than in traditional lecture based topics. This may be because PBL was a student centred method which requires active participation from each student which found to be beneficial in post session examination.

We believe that students "voted with their feet" by attending the PBL portions of the course in higher numbers than the standard lectures. Student attendance can be a reliable parameter measuring student satisfaction with the learning process. The data collected prove that the students were very motivated to attend PBL sessions independent of whether they were being graded for it.

In a study conducted by Andis Klegeris *et al* [7], attendance during problem-based learning (PBL) sessions was significantly higher compared with standard lectures.

Conclusion

PBL is an effective way of delivering medical education in a coherent, integrated programme and offers several advantages over traditional teaching methods. It is based on principles of adult learning theory, including

motivating the students, encouraging them to set their own learning goals, and giving them a role in decisions that affect their own learning.

PBL is fun for students and tutors, and the process requires all students to be engaged in the learning process. PBL improves the communication skills of the students, as in this method students work in groups. They also get informal education about group dynamics and how to do work in groups.

Students have better knowledge retention with PBL but on the understanding of the course content PBL has no added advantage over traditional lecture method. As we see, in traditional lecture method, students were exposed to some experienced, knowledgeable and inspirational teachers, who can deliver particular topic in more concise, integrated and simple form with less time consumption. Without teachers students may get information overloaded as they may be unsure how much self directed study to do and what information is relevant and useful.

Though PBL is very time consuming process, but students gave better performance in examination and the attendance of students in PBL showed that students liked this method over traditional lecture method.

Thus, in institute like Dr. Vasantrao Pawar medical college, with packed curriculum, introducing more PBL sessions is not feasible though it is more effective method of learning, so the hybrid method i.e. combination of these two methods will be more effective than any of them alone.

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Profile of Defense Injuries in Homicidal Deaths: A Prospective Study

Shah Jainik P*, Mangal H. M**, Vora Dipak H***, Chotaliya Dipak B****, Chauhan Viral N*****, Doshi Sunil M*****

Abstract

Background: The Presence of defense wound and its conclusive interpretation would be helpful to judiciary to solve many of such cases as it suggests that the victim was conscious, at least partly mobile and not taken completely by surprise. **Material & Method:** The profile of defense injuries was studied amongst the 100 cases of homicidal deaths, autopsies of which were conducted at mortuary of Government Hospital, Rajkot in a period of one and half year. **Results:** Defense injuries were seen in 28% cases of total cases of suspected homicides. Maximum number (37.5%) of cases were belongs to age group 41-50 years. Majority were male victims. Amongst all cases, 46.4% had defense wounds over left half of the body, while it was bilateral in 32.2% cases. Only sharp objects were inflicted in 60.7% of cases, while 28.6% cases had defense injuries by blunt object. Majority of defense wounds were present over upper limbs (84.9%). 36.2% of all defense injuries were sustained over forearms, may be due to nearest to the perpetrator.

Key words: Defense injury; Homicidal deaths; Sharp weapon.

Introduction

Crime is an act of moment, a psychologically creative one whose totality is beyond expression in language. Worst of the worst and the cruelest crime that can be committed by a human being upon a human being is nothing but homicide. In assault of any kind, the natural reaction of the victims is to protect him. The limb nearest to the perpetrator is used for protection and leads to infliction of defense injuries over that part of the body. Defense wounds form a valuable medicolegal evidence

for reconstructing the fatal incidence in homicidal deaths. Presence of defense wound and its conclusive interpretation would be helpful to judiciary to solve many of such cases as it suggests that the victim was conscious, at least partly mobile and not taken completely by surprise. Defense wounds are the result of immediate and instinctive reaction of the victim to save himself [1]. They are resulting from raising the arm to ward off the attack from the assailant or by gasping the weapon.

Defense injuries are commonly found on the side of the victim's body that mirrors the hand in which the attacker is holding a knife. For example, if an attacker is right handed, it will be more common for defensive injuries to be seen on the left side of the victim. The classic position of defense wound is over forearm and palmer surface of hands [2]. When attempts are made to ward off the attack, wound will be seen over back of forearm or back of hand. While in cases of gasping of the attacker's weapon, wounds will be seen on palmer aspects of hand. These injuries may be found

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on lower limbs, on thighs or on shins, if individual is lying on the ground and blows are made on lower parts of the body or genitalia. Back of the body may be injured if victims tries to curls back or turns back. The most obvious defense injuries are seen in knife attacks, as the victim often attempts to ward off the thrusts by seizing the weapon. If weapon grasped by victims has two sharp edges, wounds are present on the palm as well as on the palmer aspects of the fingers. With the sharp weapon, wounds will be incised wound, stab wound or sometimes chop wound. With the blunt weapon, wounds will be abrasions, contusions, lacerations or abraded contusions. They can also occur in firearm injuries when an arm is raised in a desperate attempt to shield the trunk or the head.

Though the presence of defense wound constitutes strong evidence in favor of homicide, absence of defense injuries does not exclude probabilities of homicide, as it may be absent if victim is attacked from behind or by surprised; is unconscious or under influence of alcohol or drugs.

Materials & Methods

Presence of defense wound and its characteristics were studied in homicidal deaths autopsies of which were conducted at Dept. of Forensic Medicine, P. D. U. (Govt.) Medical College & Hospital, Rajkot, Gujarat during the period of 1st January, 2009 to 31st august, 2010. During the study period, total 100 cases of homicidal deaths, confirmed by investigating officers before autopsies or found to be homicide at autopsies or declared as homicide during investigation, were studied.

Autopsies were conducted by routine autopsy-procedures and with routine autopsy instruments. Interpretation of defense wounds was done after considering all circumstantial evidences. Age and sex of deceased, body side and part sustaining defense wound were studied. Detailed and meticulous examination

was done regarding type of injury and weapon used for offence.

Observations

As shown in Table 1, defense wounds were present in 28 cases (28%). In the study, age group of 41-50 years had defense injuries in 37.5% cases, followed by age group of 31-40 years (33.3%) and 61-70 years (33.3%). Same was seen in 28.9% cases of age group 21-30 years. No incidence was observed below 20 years and above 70 years.

According to Table 2, amongst all male victims, 28.2 cases had defense wound. It was 27.3% for female. Both gender had almost same finding in this study. As shown in table-3, 71.4% of laborer, died due to homicidal act, had defense injuries. It was 53.3% for those who are engaged in some sort of business. In case of housewives, it was 28.6% (Table 3).

Defense wound present only over the left side of body was observed in 46.4% incidences while on both sides of body was observed in 32.2% incidences. In case of male, defense wound present over left side of body was observed in 45.6% cases, while in case of female, defense wound present in left side of body was observed in 50% incidences (Table 4).

Amongst all cases having defense injuries, sharp weapons were used in 60.7% cases; while in 28.6% cases, blunt weapons were inflicted. Firearms were used in 7.1% cases (Table-5). Total defense wounds caused by sharp force were in 67.1% cases. 61.6% of all defense injuries were incised wound. Defense wound caused by blunt force were in 26% of cases. 6.9% defense wounds were caused by firearm. 84.9% of all defense injuries were present over upper limb. 36.2% defence wounds were present over forearm, followed by defense wounds present over hands in 20.5% of cases (Table 6).

Table 1: Age Wise Distribution

Age Group	Total Cases of Homicide	Presence of Defence Wound	%
< 1 year	03	-	-
01 – 10	04	-	-
11 – 20	05	-	-
21-30	38	11	28.9
31-40	27	09	33.3
41-50	16	06	37.5
51-60	05	01	20.0
61-70	03	01	33.3
Total	100	28	28.0

Table 2: Sex Wise Distribution

Sex	Total Cases	Presence of Defence Wound	Percentage
Male	78	22	28.2
Female	22	06	27.3
Total	100	28	28.0

Table 3: Occupation Wise Distribution of Cases

Occupation	Total Cases	Presence of Defence Wounds	Percentage
Business	15	8	53.3
Laborer	14	10	71.4
Housewife	14	4	28.6
Cultivator	07	1	14.3
Service	07	1	14.3
Student	06	1	16.7
Unemployed	06	1	16.7
Driver	05	1	20.0
Not Known	05	1	20.0

Table 4: Sex Wise Distribution of Cases According to Body Side Involved

Sex	Right Side	Left Side	Both Sides	Total
Male	06 (27.2)	10 (45.6)	06 (27.2)	22 (100%)
Female	-	03 (50%)	03 (50%)	06 (100%)
Total	06 (21.4)	13 (46.4)	09 (32.2)	28 (100%)

Table 5: Distribution According to Mechanical Force Inflicted to Produce Injuries

Type of Mechanical Force	No. of Cases	%
Sharp	17	60.7
Blunt	8	28.6
Sharp & Blunt	2	3.6
Firearm	1	7.1

Table 6: Distribution of Pattern of Defense Injuries According to Affected Body Part

Body Part		Sharp force		Blunt force				firearm	Total	%
		I. W.	S.W.	Abr.	Cnts.	Abr-Cnts.	L. W.			
Upper Limb	Scapular region	04	-	-	01	-	-	-	05 (6.9)	62 (84.9)
	Shoulder	04	02	-	04	-	-	-	10 (13.7)	
	Arm	04	-	-	01	01	-	-	06 (8.2)	
	Elbow	01	-	-	-	-	-	-	01 (1.4)	
	Forearm	12	-	05	04	-	01	03	25 (36.2)	
	Hand	11	-	-	-	01	01	02	15 (20.5)	
Lower Limb	Thigh	07	02	-	-	-	-	-	09 (12.3)	11 (15.1)
	Leg	01	-	-	-	-	-	-	01 (1.4)	
	Ankle	01	-	-	-	-	-	-	01 (1.4)	
Total		45 (61.6)	04 (5.5)	05 (6.9)	10 (13.7)	02 (2.7)	02 (2.7)	05 (6.9)	73 (100)	
		49(67.1)		19(26)						

Abbreviations: I.W: Incised Wound, S.W: Stab Wound, Abr: Abrasion, Cnts: Contusion, Abr-Cnts: Abraded Contusion, L.W: Lacerated Wound

Discussion

In the study, 28.00% of victims had defense wounds, which is comparable with Sheikh et al [3], Mohanty et al [4], Hugar et al [5] and Dalal et al [6]. It is clear that 1/4 to 1/3 cases had defense wounds among these studies, suggesting the defensive reactions of victims to either ward off the attack or to hold the weapon. It also suggests the active state of mind of victims even during violence. Majority of victims having defense wound were of age between 41 to 50 years, followed by age group of 31-40 years. These findings are comparable with the findings of Sheikh et al [3]. Percentages of victims sustaining defense wounds were almost same in both genders in this study, suggestive of same state of defense approach in both, male and female.

In present study, defense wound present only over the left side of body was observed in

46.4% cases while on both sides of body was observed in 32.2% cases. These findings are comparable with the observation of Sheikh et al [3] and Mohanty et al [4]. While according to findings of Pollnen MS [7] and Hugar et al [5], it was more common on right side.

Sharp weapons were used in 60.7% of cases; while in 28.6% of cases, blunt weapons were inflicted. Hugar et al [5] had observed that sharp force and blunt force were used in 77.5% and 10.5% of cases respectively. While according to Mohanty et al [4], use of sharp and blunt force was in 57.4% and 11.1% cases respectively. Defense wounds caused by sharp force were 49 cases (67.1%); and that by blunt object were 19 cases (26%). Of all injuries caused by sharp weapons, 45 cases (61.6%) were incised wound. Only 5 cases (6.9%) defense wounds were caused by firearm. Defense wound present over forearm was seen in 25 in number (36.2%) followed by 15 in

number (20.5%) present over hand. According to Sheikh et al [3], Mohanty et al [4] and Hugar et al [5] it was observed that majority of defense wounds were present over forearms.

It can be concluded that the victims would be well aware of risk of life when sharp weapons would be raised to them. And in reaction, they may raise their forearms to ward off the attack or grasp the weapon in hand, causing injuries over forearms or hands or any other parts of body.

Conclusion

- Defense wounds were seen in 28% cases of homicidal deaths. Both genders had same rate of occurrence of defense wounds.
- 37.5% victims of age group 41-50 years had defense injuries, followed by age group
- 31-40 year and 21-30 year, in descending order. Higher proportion was observed among laborers and business occupants.
- 46.4% cases had defense injuries over left side of body, while 32.1% cases had bilateral occurrence.
- Sharp weapons were used in 60.7% cases while 28.6% cases had defense injuries by blunt force.
- 67.8% of all defense injuries were caused by sharp force. It was 23.73% and 8.47% for blunt force and firearm, respectively.

- Of all defense wounds, 84.9% injuries were sustained over upper limbs. Majority of them were present over forearm, followed by hand.

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Organophosphorous Compound Poisoning in Western Odisha: A Five Year Retrospective Study

Manoj Kumar Jena

Abstract

Background: Organophosphorous (OP) compounds are extensively used in India as insecticides and most often misused for suicide purpose. **Aim:** The present study was undertaken to know the incidence of organophosphorous poisoning, socioeconomic status and nature of poisons in the southern region of Odisha state. **Material and Method:** The study group comprised 1514 OP poisoning cases admitted to the VSS Medical College Hospital, Burla. Retrospective analysis of hospital records, post mortem reports and inquest reports were made to study the determinants. **Result:** Organophosphorous poisoning cases constituted 65.31% of total cases. Maximum number of organophosphorous poisoning cases were between the ages of 21-30 years of lower socioeconomic status. Males were more affected than female. 66.63 % of the cases were from rural area. Commonest symptoms were nausea, vomiting, pupillary constriction, sweating and excessive salivation.

Conclusion: There is an increasing trend to use organophosphorus poison as a means of committing suicide among the rural population in western Odisha which needs urgent attention by appropriate authorities.

Key words: Organophosphorous (OP) compounds; Insecticides; Suicide.

Introduction

Organophosphorous (OP) compounds are used extensively in India to control insects so as to increase production of agricultural commodities. They are not only powerful inhibitors of cholinesterase but also act directly on cholinergic nerve endings [1-2].

Individuals consume insecticides for suicidal purposes owing to not only its easy availability but also its low price, and high toxicity. Hence, organophosphorous compounds are used most often for suicidal purpose in our country [3-4]. Illness or death of a person due to OP compound poisoning may present a difficult problem in diagnosis, as the signs and symptoms may be misleading. Postmortem appearances are frequently non-specific; and the analysis of gastric contents may not be helpful because of the treatment received by

the patients and absorption of poison through skin and lungs. The problem becomes even more difficult if the body is decomposed and the chemical examination of blood and viscera is negative in such cases. ⁵

A substantial number of these deaths can be prevented with timely institution of antidotes and ventilatory support. A grade of severity of organophosphorous poisoning first proposed in 1970, and revised thereafter suggests that most cases can be managed in the intensive care unit. ⁶ Considering the above facts, the present study was undertaken in the western region of Odisha to know the type of and the incidence OP poisons and the demographic attributes of its poisoning.

Material and Methods

This study was carried out from March 2007 to February 2012 (five years) in the VSS Medical College, Burla, western Odisha. Retrospective analysis of hospital records, postmortem examination and inquest reports of all the OP poisoning related cases were done in predesigned and pretested format. The

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cases were studied from the time of admission to the hospital, and followed up until recovery or death.

The records of all the patients admitted to the hospital with the history of consumption of OP compound of either sex irrespective of severity of poisoning were included in the study, patients with only the history of consumption but without any clinical picture of OP poisoning were excluded from the study.

The enquiry was made about the type and quantity of poison consumed, duration between consumption and onset of symptoms, occupation, employment, educational status and socioeconomic status of the patient. A

detailed history regarding the marital status, mental health of parents or dependents, any such attempts of poisoning among family members and conflicts in the family was collected. The presence of any suicidal or homicidal injuries over the body were also noted in all these cases.

Results

In the 5 year study total 1,49,067 cases were admitted in the hospital, out of which 2318 cases were poisoning cases and 1514 were due to organophosphorous compound poisoning.

Table I: Year wise distribution

Groups (years)	Hospital admissions		Poisoning cases		OP poisoning cases	
	No.	%	No.	%	No.	%
2007 - 08	26,509	17.78	393	16.95	261	17.24
2008 - 09	28,018	18.79	429	18.51	279	18.43
2009 - 10	29,127	19.54	458	19.76	308	20.34
2010 - 11	32,234	21.62	491	21.18	324	21.40
2011 - 12	34,179	22.92	547	23.59	342	22.60
Total	1,49,067		2318		1514	

Table I shows that, in the year 2011 - 12, maximum number of cases were admitted in the hospital, i.e. 34,179 (22.92 %) and in the same year, maximum number of poisoning cases, i.e. 547 (23.59 %) and maximum number of organophosphorous poisoning cases, i.e. 342 (22.60 %) were admitted respectively. The share of OP poisoning cases compared to other poisoning is also increasing.

Table II: Sex wise distribution

Sex	Total		Died	
	No. of victims	% of total	No. of Death	% of affected
Male	549	59.42	187	34.06
Female	375	40.58	124	33.06
Total	924	100	311	33.66

Table - II shows that, there were 549 males (59.42 %) and 375 females (40.58 %) out of 924 cases observed with male: female ratio of 1.46: 1. The maximum number of deaths was observed in males (n = 187 deaths, 34.06 %).

Table III: Age wise distribution

Age Groups in Years	Total		Died	
	No.	% of total	No.	(%) of affected
< 10	3	0.003	1	33.33
11 – 20	234	25.32	59	25.21
21 – 30	363	39.28	119	32.78
31 – 40	138	14.93	47	34.06
41 – 50	98	10.60	41	42.27
51 – 60	68	7.35	32	47.06
61 – 70	16	1.73	9	56.25
> 70	4	0.43	3	75.00
Total	924	100	311	33.66

Maximum number of cases was observed in the 3rd decade i.e. between 21 to 30 years (Table III). There were 363 victims (39.28%) in this age group. The maximum number of deaths was also observed in the 3rd decade i.e. between 21 to 30 years. There were 119 deaths (32.78%) in this age group. In the extremes of ages, morbidity is found to be the least, but the mortality is high. There were only 4 cases (0.43%) above the age of 70 years, of which 3 died.

Table IV: Distribution according to the residential status

Area	Total		Died	
	No. of victims	(%) of the total	No. of Death	% of total affected
Urban	203	19.33	54	26.60
Rural	721	80.67	257	35.64
Total	924	100	311	33.66

Table IV shows that, most of the cases were from rural area. There were 721 victims (78.03%) from rural areas, while 203 victims (21.97%) were from urban areas. The maximum number of deaths was observed in the rural areas (n = 257 deaths, 35.64%).

Table V: Marital status of victims (n = 631)

Marital Status	Male				Female				Total			
	Total		Died		Total		Died		Total		Died	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Married	303	55.19	92	30.36	282	75.20	98	34.75	585	63.31	198	33.84
Unmarried	246	44.80	95	38.62	93	24.80	26	27.95	339	36.68	113	33.33
Total	549	59.41	187	34.06	375	40.58	124	33.15	924	100	311	33.65

Table V enumerates the relation of marital status with the distribution of OP poisoning victims. The above table shows that the maximum number of victims were married (n= 585, 63.31 %). Female victims were more frequently married (n = 282, 75.20 %) compared to males (n = 303, 55.19 %). Amongst the males, maximum (n = 95, 38.62 %) mortality was observed in the unmarried ones, and amongst the females, maximum (n = 98, 34.75 %) mortality was observed in the married ones.

Table VI: Socioeconomic status of the victims (n = 631)

Socioeconomic class	Total		Died	
	No.	(%)	No.	(%)
Lower	604	65.37	213	35.26
Middle	297	32.14	92	30.97
High	23	3.49	6	26.08
Total	924	100	311	33.66

Table VI reveals that the maximum number of victims was from lower socioeconomic classes. There were 604 victims (65.37 %) from lower socioeconomic classes, while only 23 victims (3.49 %) were from a higher socioeconomic class. The maximum deaths were observed in the lower socio – economic group (213 deaths, 35.26 %). The minimum deaths were observed in the higher socio – economic group (6 deaths, 26.08 %).

Table VII: Intention behind OP Poisoning

Intention	No. of victims	% of total victims
Suicidal	904	97.84
Accidental	17	1.83
Homicidal	3	0.32
Total	924	100

Table VII shows that most (n = 904, 97.84 %) of the cases had suicidal intention. Only 17 cases (1.83 %) were accidental. Only 3 victims gave a history of homicidal poisoning. The accidental cases were seen in agricultural workers, while spraying without proper protection and children.

Table VIII: Cited reasons behind consuming poison

Reasons	No.	%
Financial problems	637	68.93
Domestic problems	219	23.70
Unknown	68	7.35
Total	924	100

The main reason cited either by the patient or the relatives behind consuming poison in maximum number of cases was a financial problem (n = 637, 69.26 %) followed by domestic problems (n = 219, 18.86 %) Table VIII.

Discussion

The study was carried out during a five year period from March 2007 to February 2012. The total number of inpatients admitted to the Government Hospital during this period was 1,49,067, of which, 2,318 cases were due to poisoning. Of the 2,318 poisoning cases, 1,514 were due to organophosphorous compound poisoning and out of which 311 (33.65) proved fatal.

In our hospital, males were more affected (n = 549, 59.42 %) than the females (n = 375, 40.58 %). The incidence of poisoning was more common among the age group between 11 to 30 years. The maximum number of cases was observed in the 3rd decade i.e. between 21 to 30 years. Similar observations were made by other researchers from India as well as from outside India.^{6,7,8,9,10}

Our study shows that 34.78 % of patients were agricultural workers and labourers, and 18.74 % were unemployed. This could be due to easy availability and accessibility of poisons, particularly of insecticides by the agricultural workers. Accidental poisoning appears to be due to lack of knowledge, unsafe attitude and dangerous practices.¹¹

The incidence of OP compound poisoning among married people (n= 585, 63.31 %) was higher than that of unmarried ones. Amongst the males, maximum (n = 95, 38.62 %) mortality was observed in the unmarried ones, and amongst the females, maximum (n = 98, 34.75 %) mortality was observed in the married ones. Similar observations were made by other researchers across the globe.^{5,6,12,13,14}

In this study, most of the cases were suicidal (n = 904, 97.84 %) and only (n = 17, 1.83 %) of cases were accidental. The accidental cases were seen in agricultural workers, while

spraying without proper protection and children. This study shows that, most (n = 721, 78.03 %) of the cases were from rural area. The maximum number of deaths was observed in the rural areas (n = 257 deaths, 35.64 %). There were 604 victims (65.37 %) from lower socioeconomic classes, while only 23 victims (3.49 %) were from a higher socioeconomic class. The maximum deaths were observed in the lower socio – economic group (213 deaths, 35.26 %). The minimum deaths were observed in the higher socio – economic group (6 deaths, 26.08 %). This trend of suicidal poisoning by the rural population with low socioeconomic background is becoming common in developing countries, especially the Southeast Asian countries.^{7,8,11,13,14}

Conclusion

There is an increasing involvement of organophosphorus compounds as a means of committing suicide in western parts of Odisha. Adult males from rural backgrounds and from low socioeconomic strata are the most common victims. Married people are more frequently involved. Financial problems were the main reason cited for poisoning followed by domestic problems. Appropriate authorities should take urgent steps to counter this menace.

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Retrospective Study of Various Animal's Bites at District Hospital in Maharashtra

Deepak B. Phalke*, Vaishali D. Phalke**, Purushottam A. Giri***, Pallavi R. Shidhaye****

Abstract

Background: The threat of animal attacks on people is still a huge medico-social problem as these attacks result in millions of death and injuries worldwide. Snake bite along with other animal bites like dog bite, scorpion bite is a neglected public health problem. Snake bites are the common cause of mortality and morbidity in tropical countries. **Objectives:** This study was conducted to assess the extent of various bites and study the socio-demographic factors, cure rate and mortality rates of various bites at District Hospital. **Materials & Methods:** A retrospective descriptive study was carried out at the District Civil Hospital in Ahmednagar. Data regarding various animal bite cases coming to the District Hospital from January 2004 to December 2008 was collected from the registers maintained in the medical record department. A pre-designed and pre-tested questionnaire was used for the data collection. **Results:** In the present study, a total of 5461 cases of animal bites were admitted in the hospital. Majority (54.56%) were males. Maximum cases were of dog bite, 3250 (59.5%), followed by snake bites 1620 (29.6%) and 23 (0.24%) cases were of scorpion bite. Maximum cases amongst were dog bites and from 10-20 years age group, whereas snake bite was common in > 40 years. **Conclusion:** Majority bites were due to dog bites followed by snake bites. Awareness regarding early management of snake bites must be increased to decrease the mortality. Patient education is important for decreasing the incidence and morbidity of animal bites.

Key words: Animal bites; Dog bite; Snake Bite; Scorpion bite.

Introduction

The threat of animal attacks on people is still a huge medico-social problem as these attacks result in millions of death and injuries worldwide [1]. Snake bite along with other animal bites like dog bite, scorpion bite is a neglected public health problem. Snake bites are the common cause of mortality and morbidity in tropical countries. On an average 5 million snake bite cases occur worldwide causing 1 lakh deaths [2]. Nearly 2 lakh persons fall prey to snake bite every year in India and out of them 35,000 – 50,000 die every

year. But the data on morbidity of snake bite are unreliable due to improper reporting system [3]. There is a sharply increasing trend of bites of animal and insects like dogs, monkey, wasp, snake, scorpion etc, which pose a major challenge for public health authorities. These bites not only cause increased morbidity and mortality but also loss of man-days and money on treatment. Human mortality from endemic canine rabies was estimated to be 55,000 deaths per year by 56% in Asia [4]. In Maharashtra, highest incidences of snake bites have been reported (70 bites per 1, 00,000 populations and mortality of 2.4 per 1, 00,000 per year [5]. Hence the present study was conducted to assess the extent of various bites at District hospital, to study the socio-demographic factors of various bites with respect to age, sex and occupation and to study the cure rate and mortality rate of various bites.

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Materials & methods

A retrospective descriptive record based study was carried out at the District Civil

Hospital in Ahmednagar. It is the largest district of Maharashtra. Data regarding various animal bites coming to the District Hospital from January 2004 to December 2008 was collected from the registers maintained in the medical record department. A total of 5461 cases of animal bites were admitted in the hospital during the five years of the study period. A pre-designed and pre-tested questionnaire was used to get information regarding the data from registers maintained in the medical record department of District Hospital. Data regarding type of bite, socio-demographic details of cases, time interval between bite and hospital admission, the outcome of the bite was recorded. Cure rate and mortality rates of various bites was also studied. Records of all the cases were analyzed. Consent from Civil surgeon was taken prior to conduction of the study. Ethical Committee of the institute approved the study. Data were entered in MS Excel. Tests of percentages and proportions were used for statistical analysis.

Results

A total of 5461 cases of animal bites were admitted in the hospital during the study period of five years. The graph shows the pattern of various animal bites over the five years. The scorpion and other bites have remained stationary over the five years. The dog bite and snake bite cases increased during

the last year (2007-08) of the study period. Majority 2980 (54.56%) were males and 2481 (45.43%) were females. The male to female ratio of the bite cases was found to be 1.2:1. Majority of cases was of dog bites 3250 (59.5%), followed by snake bites 1620 (29.6%) and 23 (0.5%) cases were of scorpion bite. Rest 563 (10.4%) of the total bites were due to other bites like insect, bee, rat, cat which were grouped as miscellaneous. Out of total 3250 dog bites, maximum 1023 (31.5%) was in 10-20 years age group. Out of 1620 cases of snake bite, 445 (27.5%) were in age group greater than 40 years. 183 (30.9%) cases of miscellaneous bites were among the 11-20 years age group. 1003 (62.3%) cases of snake bites were farmers and 1023 (31.5%) cases of dog bites were students. Out of total 1620 snake bites, 316 (19.5%) were poisonous and majority 1304 (80.5%) were non-poisonous. The time interval between bite and hospital admission was 2-12 hours for maximum 886 (54.6%) cases of snake bites and maximum 2016 (62.0%) patients of dog bites reached the hospital within 12-24 hours.

The prognosis was classified into cured, expired and referred. Out of total 1620 cases of snake bites, 1506 (93%) were cured. 93 (5.7%) died due to snake bite and the rest were referred to other tertiary health centres. The mortality rate was 5.74% for snake bite. There were 8 (0.3%) deaths due to rabies, whereas maximum 3242 (99.7%) were cured out of total 3250 dog bites. The cure rate was 99.7% for dog bites.

Graph 1: Year wise pattern of animal bites (2004-2008), (n=5461)

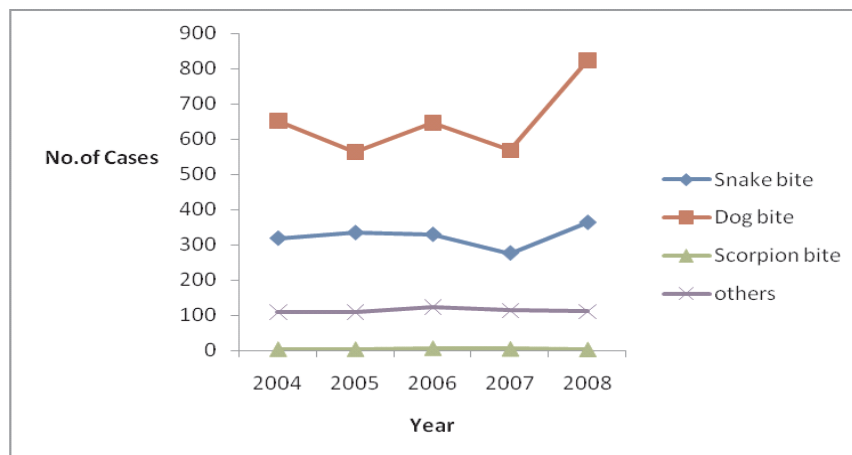


Table 1: Distribution of cases according to type of bite (n=5461)

Age (years)	Snake bite	Dog bite	Miscellaneous
0-10	119 (7.3)	813 (25.0)	107 (18.2)
11-20	268 (16.6)	1023 (31.5)	183 (30.9)
21-30	402 (24.8)	634 (19.5)	109 (18.4)
31-40	386 (23.8)	536 (16.5)	128 (21.7)
>40	445 (27.5)	241 (7.5)	64 (10.8)
Total	1620 (29.7)	3250 (59.5)	591 (10.8)

Table 2: Distribution of cases as per time interval between bite and hospital admission (n=5461)

Time interval	Snake bite	Dog bite	Miscellaneous
< 2	100 (6.2)	167 (5.1)	25 (4.2)
2-12	886 (54.6)	402 (12.4)	324 (54.8)
12-24	565 (34.9)	2016 (62.0)	179 (30.3)
24-36	56 (3.5)	339 (10.5)	52 (8.8)
36-48	13 (0.8)	326 (10.0)	11 (1.9)
Total	1620	3250	591

(Figures in the parenthesis indicate percentages)

Discussion

Animal bites pose a major public health threat both in developed and developing nations. In the present study, the dog was found to be the most common biting animal. This is similar to findings of Sudarshan *et al* [6], Sharma *et al* [7], Shetty *et al* [8] and Vyas S *et al* [9]. The results of our study regarding higher incidence of dog bites in 10-20 years are supported by other studies conducted in India. Goel S *et al* [10] showed in their study that most dog bite cases were observed in the age-group of 6-15 years, while 100% snakebite was observed in higher age-group (>15 years). Singh JS *et al* [11], Shetty *et al* [8] also depicts that more than half of animal bite victims were children of age less than 14 years. Punde DP [12] showed that 82.9% bites were in younger age groups. Maximum cases of snake bites were farmers. Similarly, Phalke DB *et al* [13] found that snake bites were maximum of the agricultural workers. In the present study, the time of arrival at the hospital after the bite was

2-12 hours in most cases of snake bites. Hayat AS *et al* [14] showed that mean time to arrival at the hospital after the bite was 3 hours. The mortality for snake bites in our study was 5.74%. Inamdar IF *et al* [15] showed that case fatality rates were higher for females (8.78%) and for bites by neurotoxic snakes (8.91%). Similar finding was observed by Kalantri S [16] with the overall mortality rate for snake bite of 11%.

Conclusion

In our study, majority bites were due to dog bites followed by snake bites. Mortality can be reduced by educating people that not all snakes are poisonous and not all poisonous bites end fatally. Awareness regarding early management of snake bites must be increased to decrease the mortality. Patient education is important for decreasing the incidence and morbidity of animal bites. Health education regarding anti-snake venom and early first aid and management must be increased. The community must be educated regarding the

complete schedule of vaccination in dog bite case. For this, NGO along with Governmental bodies should build a strong partnership at local, regional and National level.

Acknowledgement

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Hemihypertrophy and Cardiomegaly as Uncommon Findings Associated with Proteus Syndrome

Selukar Mangesh S*, Anandwadikar Suvarna V**, Dope Santoshkumar A***, Baig M. M***

Abstract

A case of Proteus syndrome in a 10 year old male is reported. Asymmetric progressive enlargement started on left side of face, trunk, left hand and left leg as he grew up, hypertrophied left eyelid, cataract changes in left eye, missing teeth on left maxilla and extra teeth on left mandible, depressed chest and red patches on left side of chest. Cardiomegaly, delayed milestones, slowed scholastic performance, sluggish speech were present. There are only few reports of such cases in adults are reported in medical journals and this syndrome has rarely reported from India.

Key Words: Hemihypertrophy, Proteus syndrome, Disproportionate and asymmetric overgrowth, diagnostic criteria; misdiagnosis; evaluation and management.

Introduction

Proteus syndrome, also known as Wiedemann syndrome (named after the German paediatrician Hans-Rudolf Wiedemann), is a congenital disorder [1] that causes skin overgrowth and atypical bone development, often accompanied by tumors over half the body [2]. Proteus syndrome is highly variable [3]. It is a congenital complex disorder consisting of asymmetric overgrowth of skin, bones, muscles, fatty tissue, blood and lymphatic vessels which resulted change the shape. This condition is first described in the American Medical Literature by Dr. Samia Temtamy and Dr. Jhon Rogers in 1976 [4, 5]. Dr. Michael Cohen described it in 1979 [6].

The occurrence of Proteus syndrome is sporadic and till now very few cases were reported worldwide. Only few cases (about 200 cases) have been confirmed worldwide, with estimates that about 120 people are currently alive with the condition [7].

In this case report, we report a case of Proteus syndrome of 10 year old male from Nanded district of Maharashtra. As attenuated forms of the disease may exist, there could be many people with Proteus syndrome who remain undiagnosed. Those most readily diagnosed are also the most severely disfigured.

Case Report

A 10 year old male, born full term following a normal delivery to no consanguineous parents was noticed to have asymmetric enlargements of the face, depressed chest and red patches on left side of chest (Fig 1).

Mother had no congenital anomalies. Father had neurofibromatosis since last 25 years. The other siblings are normal. The patient was thin built with 115 cm in height. There was progressive asymmetric enlargement, started on left side of face, trunk, left hand and left leg as he grew up.

His developmental milestones were delayed and scholastic performance was also slow. Patient while standing on both legs leans forwards. His speech was sluggish and not clears due to overgrowth of the tongue. Left palpebral conjunctiva showed a hypertrophied red mass (Fig 2). Left eye

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showed cataract changes. Teeth were missing on the left side of the maxilla and extra teeth were seen on the left side of the mandible (Fig-3). Central part of the chest shows depression. Chest X-ray shows cardiomegaly (Fig-4).

Fig 1: Showing hypertrophy on left side with depressed chest



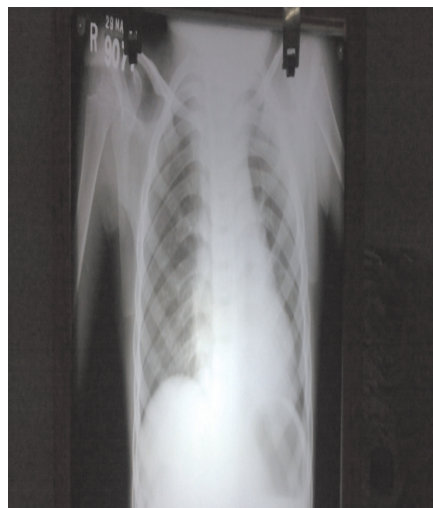
Fig 2: Showing hypertrophied left eyelid



Fig 3: Showing missing left maxillary teeth



Fig 4: PA View of chest x-ray Showing Cardiomegaly



Discussion

Proteus syndrome is a complex disorder with multisystem involvement and great clinical variability. It is a rare condition which can be categorized as a hamartomatous disorder. This condition is characterized by various cutaneous and subcutaneous lesions including vascular malformations, lipomas, hyperpigmentation and several types of naevi. As lesions appear over time due to which diagnosis may be delayed in late infancy or childhood. Orthopaedic complications often

pose the most challenging medical problems, although vascular complications also contribute to overall morbidity. Severe disfigurement and social stigmatization are additional challenges that must be addressed. It is a hamartomatous disorder described by Wiedemann *et al* 1983 [1]. Since then about 50 cases have been reported in World literature, only 4 being in adults [2]. The typical clinical features include progressive and asymmetric megalodactyly, hemihypertrophy, subcutaneous masses, and localized cerebroid thickening of the palms and soles and linear skin lesions.

Proteus syndrome is a progressive condition wherein children are born without any deformities, but tumours, skin and bone growths appear as the age advances. A team of doctors in Australia has trial tested the drug Rapamycin in the treatment of a patient said to have Proteus syndrome and have found it to be an effective remedy [8].

Molecular basis

Genetic Relation

Researchers determined the cause of Proteus syndrome. In 26 of 29 patients who met strict clinical criteria for the disorder Lindhurst *et al.* identified an activating mutation in the AKT1 kinase in a mosaic state gene [9]. A mosaic gene alteration is a change in the genetic code that is present in some of the body's cells but not others. This mutation was not present in more than 1,000 persons who were unaffected by this disorder. Previous research had suggested the condition linked to PTEN to chromosome 10, [10] while other research pointed to chromosome 16 [11]. Prior to the determination of the cause of the disease in, other researchers expressed doubt regarding the involvement of PTEN or GPC3 [12].

Embryological Relation

The post zygotic event that results clinical manifestations is embryonic somatic recombination leading to at least three subsets

of cells. These subsets include normal, overgrowth (Pleioproteus), and atrophy (Elattoproteus) cells. The discordance for Proteus syndrome is monozygotic twins suggest that the condition arises postzygotically [13]. Bony overgrowth in Proteus syndrome is secondary to mesenchymal changes during embryonic life with formation of extra large cartilage precursors.

Associated Anomalies

Hemi hyperplasia and soft tissue overgrowth are the more significant medical complications. Lesions are identified at birth in more than 17% of cases. Soft tissue and bone overgrowth may slow after puberty. Facial involvement may be associated with not only asymmetric mandibular growth, maxillary growth but also with premature dental eruption and idiopathic root resorption. Eye findings may include strabismus, epibulbar dermoids and cysts. Ocular findings are seen in 40% of cases [14]. Scoliosis or kyphoscoliosis may be severe and progressive, leading to respiratory compromise in some cases. Neck and trunk elongation with upper body wasting and leg muscle hypertrophy may contribute to abnormal body habitus and functional abnormalities. Kidney or bladder involvement is in 10% of cases in which hydronephrosis, renal cysts, asymmetry of kidney or bladder is seen. Cutaneous and subcutaneous lesions create cosmetic and functional problems. Benign growths such as lipomas, connective tissue nevi, epidermal nevi and vascular malformations are locally invasive and contribute greatly. Cystic lung malformations are seen in 10% of cases and are common in a young female patient. Either deep vein thrombosis or pulmonary embolism contributes to morbidity and mortality even in children's. Learning disabilities or mental retardation occurs in facial phenotype patients with or without CNS malformations and seizures [14].

Conclusion

The present case report showing the Proteus syndrome, aims at highlighting the uncertain anatomy and possible genetic and embryological explanation of this rare syndrome. Depressed chest is one of the rare signs associated with this case.

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Fatal Aorto-esophageal Fistula Due to Aortic Aneurysm: A Case Report

Rajesh V. Kachare MD*, Rajesh V. Bardale MD**

Abstract

Aorto-esophageal fistula is a rare and fatal disorder. Ruptured aortic aneurysms often present with sudden death and have varied clinical presentation. Here we are reporting a case of aortic aneurysm with aorto-esophageal fistula and describe the autopsy findings. An aneurysm is a permanent abnormal dilatation of blood vessel occurring due to congenital or acquired weakening or destruction of the vessel wall. Major causes of thoracic aortic aneurysm are hypertension, atherosclerosis, degenerative disease such as medial cystic degeneration and genetic disorders such as Marfan's syndrome and type IV Ehler-Danlos syndrome. Such death may present as sudden death or death with prolonged clinical features and due care should be exercised by forensic pathologist to arrive at a conclusion.

Key words: Death, aortic aneurysm, fistula, forensic, autopsy

Introduction

Aorto-esophageal fistula (AEF) is a rare and fatal disorder and represents a therapeutic challenge owing to high morbidity and mortality. [1,2] The condition was first described by Dubruei in 1818. In 1914, Chiari described the classical triad of dysphagia, thoracic pain and sentinel haematemesis followed by exsanguinations. Ruptured aortic aneurysms often present with sudden death and have varied clinical presentation depending on the site of rupture and haemorrhage. [3] Majority of aortic aneurysm rupture spontaneously however, traumatic ruptures are also reported. [4,5] Such deaths often incur medico-legal autopsies for varied medico-legal issues. Herein we report a case of aortic aneurysm with AEF and describe the autopsy findings and various issues thereof.

Case report

A 55 year old male was admitted to the surgery ward of Swami Ramanand Tirth Govt. Medical College and Hospital Ambajogai at about 17:00 hours with history of 'haematemesis' and pain in epigastrium since morning. His past history revealed that he was having intermittent haematemesis and melena since few weeks. On examination patient was conscious and cooperative with pulse 77/m, respiratory rate 16/m and blood pressure of 110/70 mmHg. There was pallor. Systemic examination was normal except for some discomfort at epigastric region on palpation. Nasogastric tube aspiration revealed fresh blood. X ray abdomen and ultrasound scan of the abdomen was within normal limit. X ray chest showed displaced trachea to right side with widening of the superior mediastinum with marginal lobulations without calcification with mass margin merging with an arch of aorta (Fig 1). After 8 hours of admission to hospital, the patient had massive haematemesis and he landed in shock and declared dead after 20 hours of admission.

A forensic autopsy was conducted. On external examination there were no injuries except that of resuscitative measures. Internal examination showed pale brain. Lungs were edematous. Heart was enlarged and weighing

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400 gm with mild left ventricular concentric hypertrophy with coronaries showing eccentric atheromatous changes. Arch of aorta showed a fusiform aneurysm measuring 5 cm in diameter with aneurysm mass compressing the oesophagus with fistula formation between the aneurysm and oesophagus draining the blood into the oesophagus (Fig 2). The internal surface of oesophagus surrounding the fistula showed scarring with irregular opening of the fistula with fresh blood found in esophageal cavity and stomach. Other abdominal organs were pale. Microscopic examination showed loss of arterial architecture with atheromatous degeneration and fibrous tissue in the media and adventitia with inflammatory cell infiltrate present.

Fig 1: showing radiological findings of widening of the superior mediastinum



Fig 2: gross examination photograph showing fistula formation between the aneurysm and oesophagus



Discussion

An aneurysm is a permanent abnormal dilatation of blood vessel occurring due to congenital or acquired weakening or destruction of the vessel wall. Degeneration of the medial layer leads to weakening of the arterial wall resulting in progressive dilatation of the wall leading to the formation of an aneurysm. Commonly aneurysms involve large elastic arteries like aorta or its branches. [4,6] Major causes of thoracic aortic aneurysm are hypertension, atherosclerosis, degenerative disease such as medial cystic degeneration and genetic disorders such as Marfan's syndrome and type IV Ehler-Danlos syndrome. [3,4] Thoracic aortic aneurysm is the most common cause of the AEF; other causes include carcinoma, trauma, foreign body ingestion and tuberculous aortitis. [1]

An aneurysm is at constant risk of rupture, either spontaneously or due to trauma. AEF can cause massive upper gastrointestinal haemorrhage that may prove fatal in the absence of treatment. Other ill-effects of such aneurysms are thrombosis and thromboembolism, alteration in the flow of blood, and compression of the neighbouring structures. [6]

Based on pathogenic mechanism, aneurysms can be atherosclerotic aneurysm, syphilitic aneurysm, dissecting aneurysm and mycotic aneurysm. [6] In the present case the gross and microscopic features suggest atherosclerotic aneurysm. Atherosclerotic aneurysms are the most common form of aortic aneurysms. These aneurysms are located most commonly in the abdominal aorta. However, they may also be present in the ascending part and arch of the aorta. At autopsy such type of aneurysm is to be differentiated from a syphilitic and mycotic aneurysm.

Death due to aortic aneurysm may be immediate if the rupture is sudden or precipitated by trivial trauma or death may be delayed with presentation of the days-long gastrointestinal bleeding until death as in the

present case. Such deaths are usually present with a herald bleeding prior to exsanguinations. Herald bleeding is usually minor and self-limiting. Bleeding can be further limited by hypotension and thrombus formation. Consequently, excessive volume therapy and endoscopy may promote fatal exsanguinations. When the patient dies of fatal exsanguinations after going to the hospital due to a herald bleeding, his family may suspect an error in medical treatment. [7] A litigation of negligence may be filed against the doctor for causing death or plea may be taken that due care have not been taken while treating the patient.

If such death is precipitated by trivial trauma then a legally question of culpability of the accused person may arise and it has to be determined by the interaction of trauma and disease. If the injury happens to be of a trivial nature and if trauma, to which the victim was subjected to, appears to be such as would have been insufficient to cause death in an otherwise normal individual then the injury can be categorized as one that is "likely to cause death". [4]

In conclusion, here we have described a fatal case of aortic aneurysm with the AEF. Such death may present as sudden death or death with prolonged clinical features and due care should be exercised by forensic pathologist to arrive at a conclusion. The medico-legal investigations in such death should be based on examination of the clinical history followed by the evaluation of autopsy findings, and microscopic findings.

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This book has been addressed to young doctors who take care of children, such as postgraduate students, junior doctors working in various capacities in Pediatrics and private practitioners. Standard Pediatric practices as well as diseases have been described in a nutshell. List of causes, differential diagnosis and tips for examination have been given to help examination-going students revise it quickly. Parent guidance techniques, vaccination and food have been included for private practitioners and family physicians that see a large child population in our country. Parents can have some understanding of how the doctors will try to manage a particular condition in a child systematically. A list of commonly used pediatric drugs and dosage is also given. Some views on controversies in Pediatrics have also been included. Few important techniques have been described which include procedures like endotracheal intubations, collecting blood samples and ventilation. I hope this book helps young doctors serve children better.

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