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Applicability to Doctors under Consumer Protection Act, 1986 and the Rules

Kadu S. Sandeep

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Abstract

In 1995, the Supreme Court in Indian Medical Association Vs V.P Shantha included the medical profession under consumer protection act. This historical judgment made havoc in the medical profession it created apprehensions in the mind of doctors that, it will lead to huge medical expenditure on insurance as well as tremendous increase in defensive medicine. The article deals with the applicability of the Consumer Protection Act 1996 and rules regarding it .Supreme court not only settled the question of coverage but also dealt with the question of medical negligence in elaborate manner.

Key words: - CPA, Negligence, tort.

Introduction

The famous words of Justice Cardazo, a celebrarel justice and former chief justice of USA "Law is a living growth and not a changeless code .The existing rules can give us our present location, our bearings or latitude and longitude; but the inn that shelters the night is not journey end. The law, like traveller must be ready for the tomorrow. It must have principle of growth. (1)

The question of applicability of the consumer protection act, 1986 to the medical profession was decided and was made applicable by the Supreme Court for the first time in the case of Indian medical association versus V.P Shantha. The question for consideration and decision before the supreme court was "whether" the medical practitioners and hospitals/nursing homes can be regarded as rendering "service" within the meaning of section 2(1)(0) of the consumer protection act, 1986.On consideration of the provision of the said act and nature of medical profession the supreme court held that the "service" rendered by a doctor by way of consultation, diagnosis and treatment, both medical and surgical is covered by "service"

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P.D.V.V.P.F'S Medical College Ahmednagar, Maharshtra within the meaning of section 2(1)(0) (2)

Discussion

The Supreme Court has carved exception to the said decision that such services rendered free of charge by a doctor or under a contract of personal service are not covered by the consumer protection act. In other words, even if a doctor renders the free services to a patient they are not covered by the consumer protection act since they are free of charge or covered by a contract of personal service. There is no difficulty in the manner of determining the question "whether the services are rendered by a doctor to a patient are free or charge or not". However, the difficulty is how to find out that the services rendered by a contract of personal service (3).

The supreme court itself has provided the distinction features." Contract of personal service" is distinguished from "contract for personal services". To constitute "contract of personal service", the Supreme Court held, it is necessary to show that there exists a relationship of master and servant. For example, employment of the medical officer for the purpose of rendering medical service to the employer is covered under a contract of employment and therefore, outside the purview of "service" within the meaning of section 2(1) (0) of the act. In all other cases, the services are, therefore, of the nature of contract for personal services covered by the Consumer

Protection Act. Coming to the services rendered free of charge and not covered by the Consumer Protection Act, are stated above there is no difficulty in finding out such services.(4)

However, the Supreme Court has gone a step further and held that even if a "free of charge service" rendered to a patient and therefore, beyond the scope of the consumer protection act. Thus the doctors working in the government hospitals/health centre/dispensary are given immunity from application of the Consumer Protection Act. However, again an exception is carved out to the same by the Supreme Court saying that the services rendered in a government hospital both on payment of charges and also free of charge are covered by the Act and in case of such a hospital even payment of token amount of registration would not alter the position. (5)

Thus, two categories of hospitals are made by the supreme court i.e. one of the hospitals rendering free of charge services to one and all the patients and another of the hospitals rendering services on payment of charges and also free of charge. The first category is given completely immunity from application of the act, whereas, the second category is held to be covered by the act. Similarly, it is held that even free of charge service rendered in a non government hospital/nursing home is out side the scope of the act. It is for this reason that Rajasthan state consumer disputes Redressal commission, Jaipur, in its decision reported in 2005-2- Consumer Protection Journals 268 (Bhunesh Kumar Bhatnagar and another versus DhapaDevi) held that the relationship was granting compensation against the doctors were set aside. However, in union of India versus A.P.Mathur(1997(3) CPJ 424 -Delhi) it was held that a person entitled to the benefit of the central Government Health Services Scheme is not a "consumer" and therefore, the Consumer Forum has no Jurisdiction to entertain a complaint. Such a patient can file a civil suit. (6)

In a recent case, the patent took the treatment in the ESI dispensary a government hospital. The service rendered in the said hospital was free. However, a reference to the provisions of ESI ACT to hold that medical facility provided to the employees in ESI hospitals is part of their service condition and therefore, it is not a free service. For this purpose, Karnataka State Consumer disputes Redressal Commission (2006(2) Cpr 86_ Rajendra sharma versus ESI Hospital and Ors) has relied on the observation of the National Commission IN para 10 of its judgement in Jagdish Kumar Bajpai's case (2005(4) Cpj197) (7).

Not only the consumer protection act was made applicable to the medical profession treating it as rendering "services" to the patients, the Supreme Court has gone a step further. In M/s spring Meadows Hospitals and another versus Harjot Ahluwalia (1998(@) BOM. C.R (*Consumer) (Supreme court), it was held by the Supreme court that if the parents of the children hired the services of the hospital for the treatment of minor child, both will be entitled to compensation if the doctor is found negligent. This was so held on the premises that even if there was no privity of contract the minor as also the parents have suffered agony and therefore, entitled to compensation. In Support of its conclusion that "minor child" is also a consumer the Supreme court has taken aid of the definition contained in clause (2) to mean " a person who hires or avails of any services and includes any beneficiary of such services other than the person who hires or avails of the services. The parents are included in the first part of the definition "consumer" since they have hired or avails of the services, whereas, "minor child" is also treated as "consumer" since he is a beneficiary of such services hired or availed of by the parents. Thus, the scope of "consumer" and "services" within the meaning of the Consumer Protection Act is widened and liability of the doctors is increased.(8)

A. Deficiency in service and the Medical Profession

The principles determining "negligence" on the part of the medical professionals are referred to above in detail. However, in a recent judgment the National Consumer Disputes Redressal Commission has adopted a very positive approach in the matter of determining "deficiency in service". It is well known case of Dr. Kunal Saha claiming huge compensation of rs.77,76.73,500/against renowned doctors. DR. Kunal Saha had also filed criminal complaint under section 304A of the Indian Penal Code and also complained to the west Bengal medical council. The National Commission has held that the courts should not sit in appeal over the decision of doctors in relation to administration of a particular dose of medicine and the jurisdiction of the consumer for a is limited to apparent in prescribing dose of medicine. Following the principle that the courts would be slow in attributing negligence on the part of doctor if he has performed his work to the best of his ability with care and caution, the National Commission has laid down salutary principles to judge such negligence.(9)

In a recent judgment, Rajasthan State Consumer Dispute Redressal Commission has gone to the extent of holding that even failure to issue medical certificate constitutes "deficiency in service" (vide 2005(2) CPJ 223 Janger Singh versus Kochar Hospital and Research Centre private Limited). To the same effect is the decision of Tamil Nadu State Consumer Disputes Redressal Commission that failure of the constitutes "deficiency in service" since the complainant could not file a claim petition before the Accident Claims Tribunal (2005(3) CPJ 169 Shanmuga Hospitals versus B.Jagadesan).(10)

B. Reference to civil court

In V.P. Shantha's case (cited above) the supreme court held that even if the doctors are subject to disciplinary control of the medical council of India or the State Medical council the service rendered by them as medical professionals would not be excluded from the application of the consumer protection act. For this purpose, reference to the powers of civil court conferred on Consumer Forum under section 13(4) of the act and the fact that the President of Forum is a person having judicial or legal experience. However, in a subsequent judgement the Supreme Court has that a consumer has held that a consumer complaint involving complicated issues requiring evidence of experts is liable to be referred to the Civil Court (11).

Suggestion

Such an expert is not possessed even by the persons having legal or judicial experience and that is the reasons as to why the Supreme Court has now required the police and the court to obtain expert before prosecuting a doctor on the charge "gross negligence" within the meaning of section 304A of the Indian penal code. The suggestion is why not refer to all complains of negligence on the part of the doctors first to the expert body of medical council and if it is found that there is negligence same may be referred to the appropriate forums for determination of appropriate relies depending on the nature of negligence. All this would help the patients, the doctors and even the courts of law (12).

In fact, while analyzing the aftermath of the latest judgment of the Supreme Court in Jacob Mathew's case has shown that the medical science is a too complex subject. In addition to the complexity of medical science, human body and its working is also a complex and complicated subject. To understand complexities of medical science and human body Vis-à-vis the complaint of deficiency of service on the part of the doctors requires only expert knowledge of the same subject (13).

References

- 1. Medicolegal aid to hospitals and doctors with CPA, M.S.Pandit and Shobha Pandit (2nd edition) pandit publications, 2007; 116: 125-126.
- VVP Santha (1992) ICP J 302 (NCDRC) (1992)1CPR 820 (MC).
- 3. http://supremecourtcaselaw.com/CPA.htm
- 4. Ins. by G.S.R 533(E) dated 14th August, 1991 (w.e.f. 14-8-1991).
- Ins. by G.S.R. 95(E); dated 27th February, 1997 (w.e.f. 27-2-1997).
- 6. Cosmopolitan Hospital Pvt. Ltd. V Vasantha P Nair and Cosmopolitan Hospital.
- Modi's Medical Jurisprudence and Toxicology (23rd edition) K.Mathharan and Amit Patnaik, Butterworths, 2005; 156-157.
- Subs. by G.S.R. 533(E), dated 14th August, 1991 (w,e.f, 14-8-1991).
- 9. Adv M.R.Varma's Doctor and Law (Ist edition), Maitri publications, 2006; 152-157.
- 10. http://www.indiankanoon.org/doc/1733066/
- 11. www.icai.org.in/resource_file/8827Consumer Protection.
- 12. www.mouthshut.com/diary/.../Consumer-Protection-Act-1986.
- 13. www.indiandoctorsguide.com/non.../consumerprotection.

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Forensic Nursing: A Subject of Need and Demand- A survey

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*Professor, **, Professor & HOD, *** PG Student

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Abstract

With the advent of medical science, along with nursing activities, the scenario of health care delivery system is changing very quickly. As medicolegal problems are very much related to this on growing change, naturally the need of the subject is also to be modified. In view of this concept, the necessity of forensic nursing as a separate chapter has come up. The assessment of demand and requirement of this unfamiliar part of nursing course was the main motto of this study. The study or survey was conducted at a rural based area. Interesting facts have come up that show a definite pattern of concern of Forensic nursing among the nursing students.

Key words: Nursing activities, forensic nursing, course, Health care delivery system.

Introduction

Midwives - "Practicing autonomously, whether self employed or employed within National Health Service, requires the midwives to understand and use this knowledge to enhance, not inhibit, the delivery of safe care "- Dr. Robyn Phillips.(1) Before starting everything it is required to present few words on our institute located at central India and very much popular as a rural institute working sincerely in service for rural India.

Kasturba hospital has the unique distinction of being the only hospital started by the father of Nation, Mahatma Gandhi, in 1944. It had 15 beds for women and children at the start. In due course of time a course for Auxiliary Nerve Midwives was worked out and a concept of people's participation in their own health care among the rural masses was explored.

The Institute trains young doctors and nurses with a rural bias. Student nurses visit the villages along with the public health nurse and do home visiting during their training.⁽²⁾

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M.L.K. Colony, QrsNo.-7, Sewagram, Wardha Maharashtra 42102 E-mail: alokemazumder94@rediffmail.com As per annual report 2007-08----"MGIMS, & KASTURBA HEALTH SOCIETY"

- " Rural NGOS working with MGIMS- 103
- " Inpatients in the year 40,244

Our country has the largest number of medical schools in the world. We produce almost 31000 doctors each year. Yet according to WHO, India has doctors, 8 nurses,5 midwives for every 10,000 people, while approx upto 19 health workers for 10,000 people. For a country with over a billion people, the numbers are woefully inadequate-President Kasturba Health Society. ⁽³⁾

In general, the term forensic medicine carries with it the connotation of death, homicide or murder. But, with the advent of medicine, crime and litigations, the field of forensic medicine could not be limited within a narrow territory and with extreme demand of society, the emerging sub discipline- "Clinical forensic Practice" has come out where naturally the role of nurse is of extreme value. In view of this, forensic nursing has been formed and it has been seen that it is not only the need of growing society associated to medical service, Forensic nursing is definitely a field of interest that must be considered with sincere view and wise thinking.

Any sub discipline of science that practices its specialty within the field of law could be

considered a branch of forensic science. Therefore as an emerging discipline forensic nursing could be said to assume an equivalence with other forensic sciences.⁽⁴⁾

Role of forensic nurse

A forensic nurse is in fact an example of innovative expansion of the role nurses can fulfill potentially in the scenario of public health, health care delivery system and public safety. Forensic nursing may provide praiseworthy contribution as they are "ideal professionals to interpret and correlate data from clinical records, laboratory results and autopsy findings. They are able to communicate with stressed physicians and beleaguered police and are able to challenge the already overwhelmed emergency department and crime laboratory personal with their findings or suspicions. They can give comfort and support to the emotionally traumatized victims of crime and their families". Michael M. Baden, MD, (5) Director, Medico legal investigations unit, New York state police, as a whole, is duties of a forensic nurse can be categorized into four parts. (6)

- 1. Suspecting that violence has occurred,
- 2. Identifying and care of injuries,
- 3. Collecting evidence in a defective manner,
- 4. Crisis intervention with referral.
- Aims and Objectives-

At every medical institute nurse are either related to nursing education systems or in direct touch with patients that includes emergency, trauma, drug associated complaints, psychiatry etc and with obvious connection, they always remain prone to face courts of law. But, very few nurses have proper conception on different medico legal out comes or interpretations. The American nurses association has recognized forensic nursing as a subspecialty since 1995⁽⁷⁾ and in 1997, the standards and scope of forensic nursing practice have been published. In India forensic nursing was first introduced to a few selected institutes in November 2003.

This study / survey has been conducted with three basic aims-

a. To know whether and how much knowledge on forensic nursing is there amongst nurses un der study.

b. How demanding is this field amongst them.

c. To create at least initial part of curiosity in the minds of nurse during discussion on forensic nursing.

Material and Methods

This study was based on a questionnaire using questions related to forensic nursing / forensic medicine practice. It has been completed by trainee nurses and nursing students of four nursing institutes of district Wardha (Central India) in the state of Maharashtra.

Questionnaire

	~	
1.	Do you have knowledge of the term Forensic nursing?	Yes / No
2	Do you know what is role of Forensic nursing?	Yes / No
3.	Do you know that medicolezal aspect is included at	Yes / No
	vourcourse?	
4.	Should Legal medicine/ Forensic runsing be added	Yes / No
	at your course curriculum?	
5.	Do you know which portion of your field is related to	Yes / No
	medico legal works?	
б.	Do you feel that a separate book is extremely	Yes/No
	necessary	
	for nuises to cover fournaic aspect?	
7.	Should Forensic nursing be recognizes as a separate	Yes/No
	subject?	
8.	During your nursing works have you ever faced any	Yes/No
_	medico legal problem?	
9.	Lo you feel medico legal idea / Foiensic musing is at	Yes/No
	all necessary in day to day nursing work?	
10	Have you ever telt helpless during work due to lack of	Yes/No
	proper medico legal knowledge?	
	11. Lo you teel a working hand book on Forensic	Yes/No
	nursing is sufficient than a detail textbook	
	partically?	37 / M-
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	15 Do ana locara in arkich combra Formaic marina	Vec (Nb
	is considered as a caracter subject?	165/140
	16 Down have knowledge of the following forensic	
	issues	
	a. Mahractice	Yes/No
	b. Vicanious liability	Yes/No
	c. Infanticide	Yes/No
	d. Sexual assault	Yes/No
	e. Indian peral code	Yes/No
	f. How to face court of law	Yes/No
	g. Duty and responsibility of nurse and patient	Yes/No
	h. Consumer protection act	Yes/No
	i. Primary chity for medico legal cases	Yes/No
	j. Reporting of cases of mechanical injuries	Yes/No
		Yes/No

Observations and Results

Table showing results of questionnaires asked in the study (No.200).

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Discussion

Total 200 candidates (Nurses of 4 institutes) were questioned as per the format mentioned. All the candidates either had come from rural background or in direct touch with rural scenario. We should remember that majority of Indian population is rural oriented and crime/litigation associated to medical service are more or less same in urban and rural areas.

It is interesting, from the study we get that about 83% agree that forensic training is required for trainee nurse (Qn No. 12).While more or less half of them feel helpless (during work) due to lack of medico-legal knowledge properly,81% of them agreed that forensic knowledge may help the society. About 68% wanted forensic nursing to be included in course curriculum and about 83% wanted forensic nursing as a separate subject and feel it is necessary in day to day nursing work.

From the above study, we can infer that though in day to day practice, nursing students, trainee nurses are facing practical problems of society, mainly in health care delivery arena, most of the time they feel helpless with shallow medico-legal ideas that is extremely necessary in today's practice. This is also very much encouraging that majority of nursing professionals are not taking forensic nursing as a new burden on existing course curriculum and they are ready to consider the sub discipline with sincerity. The enthusiastic approach to know the subject in detail shows a real zeal and courage to face problems associated to law even that shows the requirement of a deep thought to implement such branches vividly at courses in near future. The application of nursing knowledge in a spreaded scenario is very much required especially for country like India where a major percent of population try to get nursing jobs at Middle East countries mainly.

We should remember that Forensic Nursing has been adopted as a nursing and public health subject in Edith Cowan University and University of Notre Dame of Western Australia, Mount Royal College and University of Calgary of Alberta. This stream has been considered with importance in British Columbia, Kaplan College, New York and Universities at Ohio and Oklahoma.

Conclusion

India is already traumatized by violence- crime and litigations. Any country with such huge population and difficulty in health care delivery system, more trained professional nurses must be there to counteract the affected scenario and here lies the immediate requirement to give a mind to make one forensic nurse, who at a time may become an extreme help for a medico or a tremendous support for a victim. A sincere forensic nurse can be a best link between living forensic (clinical forensic medicine) and forensic after death of a deceased.

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References

- 1. Bridgit Dimond LEGAL ASPECTS of MIDWIFERY, 2006; 3/e: ix.
- 2. Report-KHS, Sewagram, Wardha, 1990.
- 3. 38th Annual report, 2007-2008, KHS-MGIMS and Kasturba Hospital, Sevagram
- Gokdogan MR, Altuncul H, Kayi Z, Yavuz MF, Turkiyede Adli Hemsireligin Geli Simi: Pilot Calisma (The development of Forensic Nursing in Turkey: Pilot Survey). Nursing forum/Hemsirelik Forum, 2003; 6(1): 16-20.
- 5. Lynch VA, Forensic nursing-Elsevier Mosby 200, pg xiv (forward).
- 6. Gokdogan MR,Zerrin Enkol, "Forensic nursing in Bohi, Turkey a survey"- Journal of clinical forensic medicine, 2005; 12(1): 14-17.

Oxidative stress and antioxidant status in pre-eclampsia and eclampsia: an application to forensic significance

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Abstract

Pre- eclampsia and eclampsia remain the major cause of both maternal and foetal morbidity and mortality; Deficiency of superoxide dismutase, Vitamin E can cause accumulation of free radicals. Therefore, in this study we have measured Nitric oxide, superoxide dismutase (SOD) Plasma thiol and vitamin 'E' in normal pregnant woman and pregnancy with Pre-eclampsia and eclampsia. In Pre-eclampsia and eclampsia significant increase in Nitric oxide level was observed (P < 0.05) as compared to the normal pregnant woman. A Significant decrease of super oxide dismutase plasma thiol and vitamin E was observed (P < - 0.001) as compared to normal pregnant woman.

Therefore, an increased Nitric oxide and decreased antioxidants may be involved in the pathogenesis of pre- eclampsia and eclampsia.

Key words: Oxidative Stress, Nitric oxide, Antioxidant

Introduction

Pre- eclampsia and eclampsia remain serious complications of pregnancy that affect both mother and child.1 Impairment of vascular endothelial cell function, causing vasospasm, may play role in the pathophysiology of preeclampsia and eclampsia.2 Impairment of cell function could be caused by oxidative stress. The unsaturated fatty acids and thiol containing Proteins in cell membrane are susceptible to free radical attack.3 Nitric oxide is free radical and is highly active molecule which reaches the cellular level. Recently nitric oxide (NO) has become of clinical interest because of its relaxant effect on smooth muscle of myometrium.4

Plasma thiol, superoxide dismutase, vitamin E scavenges free radicals and help in protection

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Professor and Head, Department of Biochemistry Pad. Dr. V. Vikhe Patil Foundation's Medical College & Hospital, Nr. Govt. Milk Dairy Vilad Ghat, Ahmednagar, Maharashtra Email: dr.padalkar@rediffmail.com on the endothelial membrane in pregnancy induced hypertension. The present study was undertaken to assess oxidative stress and antioxidant status in pre-eclampsia and eclampsia.

Material and method

Total 40 patients (pre-eclampsia-20, eclampsia-20) were selected clinical proved cases of pre-eclampsia and eclampsia along with age matched healthy normotensive pregnant women were included in this study, Nitric Oxide (NO) was estimated by method of Cortas and Wakid 1990.5 Plasma thiol levels were measured with the thiol disulphide interchange reaction between 5-51 dithio- bis (2 nitrobenzoic acid) and biological thiol.6 Erythrocyte superoxide dismutase activity was determined by Randox Kit method.7 Vitamin E was assayed by Baker and Frank method. The results were, expressed as mean + or - SD and statistically evaluated by the student 't' test.

Result

The study group with pre- eclampsia and

eclampsia was found to be associated with significantly elevated levels of nitric oxide (P < 0.05) as compared with normotensive pregnant woman and significantly reduced level of RBC superoxide dismutase activity (P < 0.001). The plasma thiol and vitamin E are as compared with control group (Table -1).

Discussion

Biological system can produce free radical and other potent oxidants in vivo are known to be consumed by cellular, extracellular antioxidant to maintain homoeostasis. An imbalance in system in favour of pro-oxidant leads to oxidative stress which contributes to many diseases. Serum nitric oxide showed significant increased (P < 0.05) in pre-eclampsia and eclampsia when compared with normotensive pregnant women.8 These finding may be because of the fact that serum concentration of nitric oxide has been used in vivo and in vitro as an index of 'NO' generation.9 Significantly increased nitric oxide in pregnancy induced hypertension with protein urea may be due to mediators such as rennin angiotensin aldosterone system. Endothelins and prostaglandins might cause vasospasm, which is basic pathophysiology of hypertension and activated Nitric Oxide Synthatase (NOS) in the vascular epithelium in response to share the stress might compensational enhance the nitric oxide production hypertension superoxide anion can inactivate the endothelium derived relaxing factor and may inhibit prostacyclin synthesis. Consequent smooth muscle contraction, vasospasm and platelet aggregation are all marked features of pregnancy induced hypertension.

The work of Stephon Wisdom 199110 has demonstrated that superoxide activity was reduced in gestational period of normal pregnancy and was lowest in pregnancy induced hypertension with protein urea. This could reflect reduced enzyme production or enzyme inactivation. Similar findings are observed in our study. Reduction of RBC, superoxide dismutase activity in pregnancy can not be ruled out, but there could be result of intermolecular or intra molecular cross links of proteins impaired enzymatic defense leads to accumulation of reactive oxygen species of O2 such as H2O2 which induces lipid peroxidation and leads to abnormal pregnancy.

The plasma thiol levels were found to be significantly decreased in pre-eclampsia and eclampsia as compared to normotensive pregnant women; such changes are compatible with oxidative stress.11The decrease plasma thiol concentration was greater than what would be expected simply from the normal hemodilutional changes of pregnancy.

It was suggested by Wong etal 1991 that the decreased levels of vitamin E pre-eclampsia are attributable to elevated levels of free radicals signifying its role as an antioxidant. Another possibility is that there is decreased absorption of vitamin E from the gut as result of vasoconstriction with preeclampsia.

The chain breaking role of vitamin E can be attributed to its ability in quenching the highly reactive lipid peroxyl intermediate by donating hydrogen and converting it into the semistable lipid peroxide. This prevents the abstraction of hydrogen from the adjacent PUFA by the lipid peroxyl radical and thus hampers the generation of the lipid carbon radical.

In conclusion, a significant elevation in nitric oxide levels was found in pre- eclampsia and eclampsia in pregnancies which contribute to pathophysiology and pathogenesis of preeclampsia and eclampsia. Some antioxidants systems such as superoxide dismutase (SOD), Vitamin E have been demonstrated to be reduced in red blood cells in pre- eclampsia.12 Hence the present study suggest that the supplement of antioxidants or free radical scavengers may benefit pregnant women of at risk of developing pre- eclampsia and eclampsia.

Medicolegal Applicability

In consumer courts most of the cases are related to pregnancy. As pregnancy has emotional attachment with family members, they are very curious about the treatment. So during antenatal period if antioxidants are supplemented, it will help to reduce preeclampsia and eclampsia mortality. This preventive measure ultimately reduces the consumer court cases against Gynecologist. It will also reduce anxiety of Gynecologist.

Table 1: The levels of Biochemical parameters in patients with Pre- eclampsia, eclampsia and controls

Biochemical Parameters	n	Nitric oxi de µmol/ lit	SOD units/ml	Thiol units /lit	Vit E mg/dl
Control group (normal pregnant women)	20	30.93 ±1.39	2.80 ±0.57	294 ±87	0.66±0.11
Pre-eclampsia	20	42.30 ± 2.0	1.02 ±0.25	248 ±81	0.53±0.14
Eclampsia	20	45.36 ± 2.59	0.89 ±0.30	238 ±82	0.36±0.18

N- Indicates no. of cases studied, Values are expressed as mean ± SD.

References

- 1. F. G. Cunningham, P. C. MacDonald. Prentice Hall. International In. East Norwolk; 1993: 763.
- 2. T.L.T. Lews, G.V.P. Chamberlain. Obstetrics Ed. Arnold Ltd London, UK, 1990: 91-94.
- 3. B.A. Freeman, D. Grapaj. Free radical and tissue injury. Lab Invest, 1982; 47: 412- 426.
- 4. Isabella, Neri Gian, Carlo, D. Renzo, Gaetano Easerrta, Andrea Gallinelli and Fabio Facchinetti. Impact of the L. Arginine/ Nitiric oxide system in pregnancy obstetrical and Gynecological survey, 1995; 50: 851.
- 5. K. Cortas Najwa and W. Wakid Nabil. Deter mination of Inorganic nitrate in serum and urine by Kinetic cadmium reduction method. Clinical Chemistry, 1990; 36(8): 1440-1443.
- 6. G. I. Ellman. Tissue sulphydryl groups Arch Biochem. Biophysics, 1959; 82: 70-77.
- 7. RANDOX Antioxidant Product J. Lab. Clinmed Feb., 1997; 70: 158 - 168.

- N. Toshikatsu, T. Yashihiro, H. Kazumasa, Tadashi k etal, Plasma nitric oxide level in pregnant patients with pre- eclampsia and essential hypertension. Gynecol. Obstet. Invest, 1996; 41: 189-193.
- 9. J. M. Langor, N. Murase, P. M. Markus, P. Nehus, W. Schraut, R. I. Simmons, J. of Clinical Invest, 1992; 90: 679.
- Stephen J. Wisdom, J. J. Rhoda Wilson, J. H. Walkar. Am. J. Obstet and Gynecol, 1991; 165: 1701- 1704.
- J. C. Banfored, D. M. Brown, R. A. Hazelton, G. J. Mc Neil, W. E. Smith., R. D. Sturrock. Altered thiol status in patient with rheuma toid arthritis: Rheumatol Int, 1982; 2: 107-111.
- S.J. Wisdom, J. H. Wilson R Mckillop, J. J. Walkar. Antoxidant system in normal Pregnancy and pregnancy Induced hypertension. Am. J. Obstet. Gynecol, 1991; 165: 1701- 1704.

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Environmental exposure of Arsenic and related health hazards-a review

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Abstract

Arsenic is historically the poison of choice for many murders, in reality and in fiction. Here, arsenic is dealt with only as mineral specimens and is not to be ingested. Although it has been used as a poison, arsenic has many chemical uses and is quite an important element. Exposure to higher than average levels of arsenic occur mostly in the workplace, near hazardous waste sites, or in areas with high natural levels. At high levels, inorganic arsenic can cause death. Exposure to lower levels for a long time can cause a discoloration of the skin and the appearance of small corns or warts. Arsenic has been found in at least 1,149 of the 1,684 National Priority List sites identified by the Environmental Protection Agency.

Key words: Arsenic, exposure, hazards.

Introduction

Arsenic, a naturally occurring element, is found throughout the environment. It is released in to the environment through natural as well as anthropogenic sources. Natural sources include volcanoes, the weathering of arseniccontaining minerals and ores. Smelting of nonferrous metals such as copper smelting, mining, coal burning and the production of energy from fossil fuel are the major industrial processes that lead to Arsenic contamination of air, water and soil. High arsenic levels can also come from certain fertilizers and animal feeding operations.

For most people, food is the major source of exposure. Inorganic Arsenic is present in groundwater used for drinking in several countries all over the world (e.g. Bangladesh, Chile and China), whereas organic Arsenic compounds (such as arsenobetaine) are primarily found in fish, which thus may give rise to human exposure.

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Acute (short-term) high-level inhalation exposure to arsenic dust or fumes has resulted in gastrointestinal effects (nausea, diarrhea, abdominal pain); central and peripheral nervous system disorders have occurred in workers acutely exposed to inorganic arsenic. Chronic (long-term) inhalation exposure to inorganic arsenic in humans is associated with irritation of the skin and mucous membranes. Chronic oral exposure has resulted in gastrointestinal effects, anemia, peripheral neuropathy, skin lesions, hyper pigmentation, and liver or kidney damage in humans. Inorganic arsenic exposure in humans, by the inhalation route, has been shown to be strongly associated with lung cancer, while ingestion of inorganic arsenic in humans has been linked to a form of skin cancer and also to bladder, liver, and lung cancer. USEPA has classified inorganic arsenic as a Group A, human carcinogen.

Occurrence of Arsenic in Nature

Arsenic is a semi-metal element and was first documented by Albertus Magnus in 1250.⁽¹⁾ It is odorless and tasteless.⁽²⁾ Arsenic is widely distributed in the earth's crust and present at an average concentration of 2 mg/kg. It occurs in trace quantities in all rock, soil, water and air. Inorganic arsenic is a naturally occurring element in the earth's crust. Pure inorganic arsenic is a gray-colored metal.

Arsenic combined with elements such as oxygen, chlorine, and sulfur forms inorganic arsenic; inorganic arsenic compounds include arsenic pentoxide, arsenic trioxide, and arsenic acid. Arsenic combined with carbon and hydrogen forms organic arsenic; organic arsenic compounds include arsanilic acid, arsenobetaine, and dimethylarsinic acid.⁽³⁾

The most important compounds of arsenic are arsenic (III) oxide, As2O3, ("white arsenic"), the yellow sulfide orpiment (As2S3) and red realgar (As4S4), Paris green, calcium arsenate, and lead hydrogen arsenate. Elemental Arsenic is not soluble in water. Arsenic salts exhibit a wide range of solubility depending on pH and the ionic environment.⁽⁴⁾

Arsenic and Environment

Inorganic arsenic is found throughout the environment; it is released into the air by volcanoes, the weathering of arsenic-containing minerals and ores, and by commercial or industrial processes.^(3, 5) For most people, food is the largest source of arsenic exposure (about 25 to 50 micrograms per day $[\mu g/d]$), with lower amounts coming from drinking water and air. Among foods, some of the highest levels are found in fish and shellfish; however, this arsenic exists primarily as organic compounds, which are essentially nontoxic.⁽³⁾

Elevated levels of inorganic arsenic may be present in soil, either from natural mineral deposits or contamination from human activities, which may lead to dermal or ingestion exposure. Workers in metal smelters and nearby residents may be exposed to above-average inorganic arsenic levels from arsenic released into the air (3). Other sources of inorganic arsenic exposure include burning plywood treated with an arsenic wood preservative or dermal contact with wood treated with arsenic.⁽⁵⁾ Most arsenic poisoning incidents in industry have involved the production of arsine, a short-lived, extremely toxic gas.⁽⁶⁾ Humans are exposed to arsenic through air, drinking water, and food (meat, fish, and poultry); this food is usually the largest source of arsenic. Arsenic was also found in wine if arsenic pesticides are used in the vineyard.

High arsenic levels can also come from certain

fertilizers and animal feeding operations. Industry practices such as copper smelting, mining and coal burning also contribute to arsenic in our environment. Smelting of nonferrous metals and the production of energy from fossil fuel are the two major industrial processes that lead to Arsenic contamination of air, water and soil.⁽⁷⁾

Arsenic and Human beings

Arsenic is well absorbed by oral and inhalation routes, widely distributed and excreted in urine; most of a single, low-level dose is excreted within a few days after consuming any form of inorganic arsenic. Remains of arsenic in nails and hair can be detected even after years and years after the exposure.⁽⁴⁾

Arsenic (or metabolites) concentrations in blood, hair, nails and urine have been used as biomarkers of exposure. Arsenic in hair and nails can be useful indicators of past Arsenic exposure, if care is taken to avoid external Arsenic contamination of the samples. Speciated metabolites in urine expressed as either inorganic Arsenic or the sum of metabolites is generally the best estimate of recent Arsenic dose. However, consumption of certain seafood may confound estimation of inorganic Arsenic exposure, and should thus be avoided before urine sampling.⁽⁸⁾

Arsenic and many of its compounds are especially potent poisons. Arsenic disrupts ATP production through several mechanisms. At the level of the citric acid cycle, arsenic inhibits pyruvate dehydrogenase and by competing with phosphate uncouples oxidative it phosphorylation, thus inhibiting energy-linked reduction of NAD+, mitochondrial respiration, and ATP synthesis. Hydrogen peroxide production is also increased, which might form reactive oxygen species and oxidative stress. These metabolic interferences lead to death from multi-system organ failure probably from necrotic cell death, not apoptosis. A post mortem reveals brick red colored mucosa, due to severe hemorrhage. Although arsenic causes toxicity, it can also play a protective role.⁽⁹⁾

Absorption of Arsenic in inhaled airborne particles is highly dependent on the solubility and the size of particles. Soluble arsenic compounds are easily absorbed from the gastrointestinal tract. However, inorganic Arsenic is extensively methylated in humans and the metabolites are excreted in the urine.⁽⁸⁾

Arsenic and Health Hazards

The importance of arsenic as a health hazard, which is also known as 'slow killer' is now well recognised. The most obvious signs are the blisters on the palms of the hands and soles of the feet, which can eventually turn gangrenous and cancerous. Meanwhile, the poison also attacks internal organs, notably the lungs and kidneys, which can result in a battery of illnesses including cancers.⁽¹⁰⁾

Inorganic Arsenic: Acute Effects

Acute inhalation exposure of workers to high levels of arsenic dusts or fumes has resulted in gastrointestinal effects (nausea, diarrhea, abdominal pain), while acute exposure of workers to inorganic arsenic has also resulted in central and peripheral nervous system disorders.⁽³⁾

Acute oral exposure to inorganic arsenic, at doses of approximately 600 micrograms per kilogram body weight per day (μg/kg/d) or higher in humans, has resulted in death. Oral exposure to lower levels of inorganic arsenic has resulted in effects on the gastrointestinal tract (nausea, vomiting), central nervous system (CNS) (headaches, weakness, delirium), cardiovascular system (hypotension, shock), liver, kidney, and blood (anemia, leukopenia).^(3, 5) Acute animal tests in rats and mice have shown inorganic arsenic to have moderate to high acute toxicity.⁽¹¹⁾

Chronic Effects (Non cancer)

Chronic inhalation exposure to inorganic arsenic in humans is associated with irritation of the skin and mucous membranes (dermatitis, conjunctivitis, pharyngitis, and rhinitis). Chronic oral exposure to inorganic arsenic in humans has resulted in gastrointestinal effects, anemia, peripheral neuropathy, skin lesions, hyper pigmentation, gangrene of the extremities, vascular lesions, and liver or kidney damage.^(3,5)

Several studies have suggested that women who work in, or live near, metal smelters may have higher than normal spontaneous abortion rates, and their children may exhibit lower than normal birth weights. However, these studies are limited because they were designed to evaluate the effects of smelter pollutants in general, and are not specific for inorganic arsenic. Ingested inorganic arsenic can cross the placenta in humans, exposing the fetus to the chemical. Oral animal studies have reported inorganic arsenic at very high doses to be fetotoxic and to cause birth defects.⁽⁴⁾

Arsenic and Drinking water

Inorganic Arsenic is present in groundwater used for drinking in several countries all over the world (e.g. Bangladesh, Chile and China), whereas organic Arsenic compounds (such as arsenobetaine) are primarily found in fish, which thus may give rise to human exposure.⁽⁸⁾ Millions of persons in the world-including more than 3 million in the United States and more than 70 million in Bangladesh and adjoining West Bengal, India are chronically exposed to arsenic through drinking water. Epidemiological studies on children, living in the vicinity of a coal power plant in Czechoslovakia where coal that was used contained about 1000-1500 g arsenic per tonne, showed respiratory symptoms and hearing loss.⁽¹⁰⁾ Arsenic contamination of groundwater has led to a massive epidemic of arsenic poisoning in Bangladesh and neighboring countries.

In India Arsenic contamination in ground water has been observed in some parts of the States of West Bengal, Bihar, Uttar Pradesh, Assam and Chhattisgarh. In West Bengal, occurrence of high concentration of arsenic in ground water has been observed in the depth range of 20 - 80 m in the area east of river Bhagirathi in parts of 8 districts viz. Malda, Murshidabad, Nadia, North 24 Parganas, South 24 Parganas, Hoogli, Howrah, and Bardhaman. Occurrence of Arsenic in excess of permissible limit in ground water has been observed in the alluvial aquifers in the depth range of 10-70 meter below ground level in parts of Patna, Bhojpur, Begusarai, Khagaria, Samastipur, Bhagalpur, Saran, Munger, Katihar, Buxar, Vaishali and Darbhanga districts. In Uttar Pradesh, arsenic contamination in ground water has been reported from parts of Gonda, Balia, Balrampur, Lakhimpur Kheri and

Siddharthnagar districts. In Assam, ground water in parts of Dhemaji District is reported to be affected by arsenic contamination. Occurrence of arsenic in these states is associated with sediments in Ganga - Brahmaputra basin. Localized occurrence of arsenic in ground water has been reported from parts of Rajnandgaon district of Chhattisgarh due to arsenopyrite mineralization in the fractured zones in hard rock terrain.⁽¹²⁾

Presently 42 major incidents around the world have been reported on groundwater arsenic contamination. It is estimated that approximately 57 million people are drinking groundwater with arsenic concentrations elevated above the World Health Organization's standard of 10 parts per billion. However, a study of cancer rates in Taiwan⁽¹³⁾ suggested that significant increases in cancer mortality appear only at levels above 150 parts per billion. The arsenic in the groundwater is of natural origin, and is released from the sediment into the groundwater due to the anoxic conditions of the subsurface.⁽⁴⁾

The northern United States, including parts of Michigan, Wisconsin, Minnesota and the Dakotas are known to have significant concentrations of arsenic in ground water. Increased levels of skin cancer have been associated with arsenic exposure in Wisconsin, even at levels below the 10 part per billion drinking water standard.⁽¹⁴⁾

Epidemiological evidence from Chile shows a dose dependent connection between chronic arsenic exposure and various forms of cancer, particularly when other risk factors, such as cigarette smoking, are present. These effects have been demonstrated to persist below 50 parts per billion.⁽¹⁵⁾

Analyzing multiple epidemiological studies on inorganic arsenic exposure suggests a small but measurable risk increase for bladder cancer at 10 parts per billion (16). According to Peter Ravenscroft of the Department of Geography at the University of Cambridge roughly 80 million people worldwide consume between 10 and 50 parts per billion arsenic in their drinking water. If they all consumed exactly 10 parts per billion arsenic in their drinking water, the previously cited multiple epidemiological study analysis would predict an additional 2,000 cases of bladder cancer alone.⁽⁴⁾

Arsenic and Carcinogenic effect

Several studies have shown that inorganic Arsenic can increase the risk of lung cancer, skin cancer, bladder cancer, liver cancer, kidney cancer, and prostate cancer. The World Health Organization⁽¹⁷⁾, the Department of Health and Human Services⁽¹¹⁾ and the USEPA⁽⁶⁾ have determined that inorganic Arsenic is a human carcinogen.

Human, inhalation studies have reported inorganic arsenic exposure to be strongly associated with lung cancer. Ingestion of inorganic arsenic in humans has been associated with an increased risk of nonmelanoma skin cancer and also to an increased risk of bladder, liver, and lung cancer. USEPA has classified inorganic arsenic as a Group A, human carcinogen.^(3, 5, 18)

Arsenic ingestion has been reported to increase the risk of cancer at internal sites, especially lung, urinary bladder, kidney, and liver (19). Populations exposed to Arsenic via drinking water show excess risk of mortality from lung, bladder and kidney cancer, and the risk increasing with increasing exposure. There is also an increased risk of skin cancer and other skin lesions, such as hyperkeratosis and pigmentation changes⁽³⁾

Arsenic and Recommended Permissible Limits

USEPA has set limits on the amount of Arsenic that industrial sources can release to the environment and has restricted or canceled many uses of Arsenic in pesticides. USEPA has set a limit of 0.01 parts per million (ppm) for Arsenic in drinking water. The Occupational Safety and Health Administration⁽²⁰⁾ have set limits of 10 μ g Arsenic per cubic meter of workplace air (10 μ g/m3) for 8 hour shifts and 40 hour work weeks.

References

- Emsley J. An A-Z Guide to the Elements. Oxford: Oxford University Press Nature's Building Blocks. 2001; 43: 513-529.
- 2. US Environmental Protection Agency. Arsenic in drinking water. accessed in 2008. Available from:

http://www.epa.gov/safewater/arsenic/ index.html.

- Agency for Toxic Substances and Disease Registry (ATSDR) Toxicological Profile for Arsenic (Draft).
 U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA; 1998.
- 4. Wikipedia- The free encyclopedia. Arsenic. accessed in 2008. available from: http:// en.wikipedia.org/wiki/Arsenic.
- 5. Agency for Toxic Substances and Disease Registry (ATSDR). Case Studies in Environmental Medicine. Arsenic Toxicity. U.S. Public Health Service, U.S. Department of Health and Human Services, Altanta, GA; 1990.
- U.S. Environmental Protection Agency Health Assessment Document for Inorganic Arsenic. EPA/540/1-86/020. Environmental Criteria and Assessment Office, Office of Health and Environmental Assessment, Office of Research and Development, Washington, DC; 1984.
- Chilvers DC, Peterson PJ. Global cycling of arsenic. In: Hutchinson TC, Meema KM, editors. Lead, mercury, cadmium and arsenic in the environment. SCOPE. John Wiley & Sons, 1987; 31: 279-301.
- 8. Environmental Health Criteria (EHC). Arsenic and Arsenic Compounds; World Health Organization, Geneva; 2001: 124.
- 9. Klaassen C, Watkins J. Casarett and Doull's Essentials of Toxicology. McGraw-Hill: 2003.
- 10. Rai UN, Pal A. Health Hazards of Heavy Metals. Enviro news. News letter of ISEB India. 2002; 8(1)
- U.S. Department of Health and Human Services. Registry of Toxic Effects of Chemical Substances (RTECS, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD; 1993.

- 12. Ministry of Water Resources. Ground Water Quality Scenario. India. accessed in 2008. Available from: http://wrmin.nic.in/ index3.asp?subsublinkid=782&langid=1&sslid=801
- 13. Lamm SH, Engel A, Penn CA, Chen R, Feinleib M. Arsenic cancer risk confounder in southwest Taiwan data set. Environ Health Perspect, 2006; 114 (7): 1077-82.
- Knobeloch LM, Zierold KM, Anderson HA. Association of arsenic-contaminated drinkingwater with prevalence of skin cancer in Wisconsin's Fox River Valley. J Health Popul Nutr, 2006; 24 (2): 206-13.
- 15. Ferreccio C, Sancha AM. Arsenic exposure and its impact on health in Chile. J Health Popul Nutr. 2006; 24 (2): 164-75.
- 16. Chu HA, Crawford-Brown DJ. Inorganic arsenic in drinking water and bladder cancer: a metaanalysis for dose-response assessment. Int J Environ Res Public Health, 2006; 3 (4): 316-22.
- World Health Organization (WHO). Recommendations in Guidelines for Drinking Water Quality, vol. 1, Geneva, Switzerland; 1993.
- U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) on Arsine. National Center for Environmental Assessment, Office of Research and Development, Washington, DC; 1999.
- 19. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for Arsenic and Cadmium. United States Department of Health and Human Services; 2000. Accessed October 2006. Available from: http://www.atsdr.cdc.gov
- 20. Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Standards, Toxic and Hazardous Substances. Code of Federal Regulations; 1998.

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Abstract

The Internet is a never-ending fountain of information for people in relation to Forensic Science in this techno - savvy world. The number of people using Internet have increased in massive proportions since its inception in 1969 and expected to improve 100% in near future. This review provides readers with a host of information for the use of Internet as a way to enlighten them self with knowledge pertaining to Forensic Science. We have gone through various sites in Internet and gathered information which will be helpful for a Medico-legal person, lest for a Forensic expert. This article is of unique nature because of the inclusion of Indian Forensic Science related web sites. The sites featured here were thoroughly searched in view of its potentiality, utility, credibility and accountability in regard to Forensic Science and modalities. We believe, this overview will play a major role in stimulating Forensic Scientist, Medico-legal experts or any other Law-related professionals in usage of web for teaching, training and research.

Key words: Internet, World Wide Web, Forensic science and Impact of the Web and its limitations

Introduction

The Internet is never ending fountain of information for people in relation to Forensic science in this techno-savvy world. There has been an exponential increase in the amount of information available through the web over recent years. This increase has been matched by an increase in the number of individuals using Internet in day-to-day life. With on and around 320 million pages available¹, the Internet has had an influence on every day life. The numbers of people using Internet have been increasing since the last few years. In UK, an estimated 15 million users of web are seen second only to none other than USA². Even though Internet has been plagued for commercial benefits, it still remains as a powerful instrument for exchange of scientific knowledge3. This establishment of World Wide Web (WWW) has paved way for the enthusiastic people to learn and distribute the knowledge in their own words. The Internet

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Professor & Head Department of Forensic Medicine NRI Medical College, Chinakakani Guntur Distric, A.P. E-mail: dr.gvnreddy@yahoo.com is literally serving as a life-line for different communities in various disciplines of research areas. With just a click of the mouse, any information related to any field can be accessed in few seconds; with the use of World Wide Web (WWW), additional features like web camera etc. can be used for instant recording and sending videos. Hundreds of hours spent in searching information in books in a library can be done in a second. Internet has improved lifestyle in an unimaginable manner.

The birth of Internet occurred in 1969 when ARPANET (Advanced Research Projects Agency Net) was commissioned. This lead to a great increase in the growth of NET and the number of users started is doubled in three months. In Mid 1993, there were a total of 130 web sites in the world; right now they run into millions. As per estimates in 2004, the number of web users would be closed to a billion; 280 million English and 657 million non-English speaking people⁴. National Science Foundation Network (NSFNET) replaced the ARPANET in 1990. Computer science department in the Massachusetts Institute of Technology developed WWW in 1989 jointly with the European centre for Practice research as a Standard user interface5.

World wide web (www)

The Internet is a massive, worldwide network of interconnected computers. It comprises of several communication media, one being WWW. It is a graphical interface to sites all over the world containing pictures, sound, and videos. WWW is Internet's most exciting development because of its user - friendly interface. Based on the use of hypertext (a fragment of text that refers to information else where that can be accessed with a mouse click), web pages are written is the Hyper Text Mark-up Language (HTML), which is sent through hypertext transfer protocol (http). WWW has many web sites, each having a unique digital address and Uniform Resource Locator (URL). This URL has a general form http://www.ou.ac.in/, where 'http' refers to the protocol used, and 'ou.ac.in' refers to the server (Computer) where the information is stored. The browser allows the user to know the information on a web page. The most commonly used being the Netscape Navigator and the Microsoft explorer.

Forensic scientists and the Medico-legal experts have very little time to learn about complex computer systems or their commands. The 'Point and Click' strategy of the WWW has virtually increased the computer usage for the sake of Internet. People of various forensic departments of this modern age will be benefited if they can also learn and use the Internet resources, its language6 and tools.

Different search tools over internet

WWW has an enormous content of information and a systematic way of search is needed for proper accessing of information, which prevents the wastage of time. In order to effectively browse information, it is important to have an idea of what we are searching for and also a search tool best suits for your job to be done. There are various searching tools on the Internet. Some of them are listed below:

Search Engines

The usage of Search engines is very minimal, when not used correctly as they may return lot of useless information. Search Engines available on the Internet are given on Table1.

Google	http://www.google.com or www.google.co.in
Lycos	http://www.lycos.com
Exite	http://www.exite.com
Yahoo	http://www.yahoo.com
Galaxy search	http://www.galaxy.com
Alta Vista	http://www.altavista.digital.com
Webcrawler	http://www.webcrawler.com
Northern Light	http://www.nlsearch.com
In-foseek	http://www.infoseek.com
Hot Bot	http://www.hotbot.com
Looksmart	http://www.looksmart.com

Table 1 - List of Search Engines

Meta Search Engines

The advantage of Meta search engines are over any other search engine is that, users query simultaneously searched on several other search engines and directories. Some of the Meta search engines are given on Table 2.

Table 2. List of Meta Search Engines

Dog pile	http://www.dogpile.com
Eliter	http://www.eliter.com
PopularSites	http://www.popularsites.com
Jugalug Mp3	http://www.jugalug.com
The BigHub	http://www.thebighub.com
CurryGuide	http://services.currguide.com
Megasources	http://www.acr.ryerson.ca/~journal/ Megasourses.html

Indian Search Engines

Some of the Indian search engines are given on Table 3.

123 India	http://www.123india.com
Khoj	http://www.khoj.com
Agni	http://www.indiawatch.org.in/agni
Indian Homepage	http://indiatime.com/urls/Search indiaurls.htm.com
Search Engine	http://searcg.keralanuada.com/forIndiainternetservices

Table 3. List of Indian Search Engines

Open directory project

The Open directory project operates the goal of creating useful information resources and also is one of the most comprehensive human - edited directories of the Web. It is the only major directory that is totally free. It is made available free to the user who agrees with the free use license. The open directory powers the core directory services for some of the most popular engines like Google, Netscape search, Lycos etc.

Forensic Science on the internet

The Forensic science refers to a group of specialties in science and medicine that apply their principles and methods to legal questions of a Criminal or Civil nature7 for the administration of justice. The boundaries of Forensic science are not only limited to the research labs of Pathologists, Serologists, Psychiatrists, Odontologists, Toxicologists, Chemists, Molecular biologists, Entomologists, and Criminologists but also extends to Court room for their expert witness in times of need.

The internet can be used by the forensic people not only to read and send e-mail, access to photographs, video samples, text books, graphs, journals, abstracts, etc., but also to join in a discussion forum group, who are actively involved in the research and development of the subject, which will give the individual the scope for him to enhance his knowledge in his field by knowing the latest advancements in the science and technology for his forensic investigation. Along with the above, information about education, research and job opportunities can also be accessed. Expert consultation can be given/ provided online to the government and Non-Government Organizations in times of necessity voluntarily / non - voluntarily.

There are many databases available on the Net which are very useful to Forensic science experts and also to people from other subjects. One such database is MEDLINE. It is a premier bibliographic database of National Library of Medicine (NLM) covering various fields like medicine, Nursing, Dentistry, etc. Citations for MEDLINE are created by the NLM, International MEDLARS partners, and Co-operating professional organizations. Every week MEDLINE records are incorporated into Pub Med (http://www.ncbi.nlm.gov/pubmed/), which will be assigned a Pub Med unique identifier.

The use of Webliography for the forensic Science is to direct people to some of the best resources on the Web for research and information8. According to the spring 2003 issue of issues in science and technology librarianship, there are a total of 101 - sites in all - referring to Forensic science resources9. In October 2003, the C & RL News published an article, which focuses on free web sites, which also includes a section on Medical death investigation10.

The present article has gathered the resources on the web for Forensic sciences related web sites in India. Here we also included some of the additional web resources on non-Indian origin for the associated subjects in forensic science like Forensic pathology, Forensic serology, Forensic entomology etc. List of some of the links and resources other than India are furnished in the Table 4.

Table.4 List of directory resources

Journals, magazines and news letters

Indexed

Finding Forensic science literature is always a chal-

lenge, because every time it is indexed only in one index or on the Website of publisher or by multiple indexes. A list of indexed journals (with abstract and full text) is given on the Table 5.

American Journal of	http://www.amjforensicmedicine.com/
Forensic Medicine and Pathology	
Forensic Science International	http://www.sciencedirect.com/science/
	journal/03790738
Canadian Society of	http://ww2.csfs.ca/csfs_journal.aspx
Forensic Science Journal	
Journal of Forensic Identification	http://www.theiai.org/publications/jfi.html
Forensic Science Review Indexes	http://www.geocities.com/CapeCanaveral/
	Galaxy/2044/index.html
Information Bulletin for Shoeprint/Toolmark	http://www.intermin.fi/intermin/hankkeet/wgm/
Examiners	home.nsf/pages/47A43E6C3D552B2CC2256C8E003C04D0
International Journal of Legal Medicine	http://link.springer-ny.com/link/service/
	journals/00414/index.htm
Journal of Forensic Sciences	http://www.aafs.org/?section_id=
	journal_of_fs&page_id=searchable_index
Science & Justice	http://www.forensic-science-society.org.uk/
(form erly Journal of the Forensic Science Society)	publications/saj.html
Identification Canada	http://www.cis-sci.ca/Content/index.htm
American Journal of	http://www.forensicpsychonline.com/
Forensic Psychiatry	callforpapers.htm
American Journal of	http://www.forensicpsychology.org/
Forensic Psychology	journalpg.html
Australian Journal of	http://search.informit.com.au/browseJournal
Forensic Sciences	Title;res=E-LIBRARY;issn=0045-0618
British Journal of	http://www.pavpub.com/pavpub/
Forensic Practice	journals/BJFP/index.asp
Journal of	http://www.afde.org/journal.html
Forensic Document Exam ination	
Journal of Forensic Identification	http://www.theiai.org/publications

Table. 5: List of indexed journals (Abstracts and full text)

Forensic sciences journals are available on the

Internet, which are listed below, are accessible to the members of the association/s published. List of Full text journals are given on Table 6.

FBI Law Enforcement Bulletin	http://www.fbi.gov/publications/
	leb/leb.htm
Forensic Science Communications	http://www.fbi.gov/hq/lab/fsc/
	current/index.htm
In the Spotlight: Forensic Science	http://www.ncjrs.org/forensic/
	summary.html
Crime and Clues: The Art and	http://www.crimeandclues.com/
Science of Criminal Investigation	index.htm
FACES forward	http://www.ga.lsu.edu/faces/
	forward.html
Scientific Testimony: An Online Journal	http://www.scientific.org
International Journal of Drug Testing	http://www.criminology.fsu.edu/
	journal
Forensic Echo: Behavioral &	http://echo.forensicpanel.com
Forensic Sciences in the Courts	
IABPA Newsletter	http://www.iabpa.org/newslett.htm
I.J.D.E.: International	http://www.utica.edu/academic/
Journal of Digital Evidence	institutes/ecii/ijde

Fable. (6:	List	of	full	text	journals	web	sites
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Forensic Science E – Books

books are furnished on Table 7

Forensic Ne lLBatse f web sites related to Forens	http://www.forensicnetbase.com/
Handbook of Forensic Services	forensics pdf
Freedom o <mark>f Information Act</mark> Electronic Reading Room	http://foia.fbi.gov/room.htm
Death Inv <mark>estigations:</mark> A Guide f <mark>or the Scene Investigator</mark>	http://www.ncjrs.org/pdffiles/167568.pdf
FBI's Free <mark>dom of Information Act Electronic</mark> Reading R <mark>oom</mark>	http://foia.fbi.gov/room.htm
FBI Famous Cases	http://www.fbi.gov/libref/historic/ famcases/famcases.htm
Forensic S <mark>cience Society's Book Reviews</mark>	http://www.forensic-science-society.org.uk/ publications/ br. html
National Criminal Justice Reference Service	http://www.ncjrs.gov/viewall.html

Organizations

Government and Commercial Laboratories

Here in this section, details of government and commercial Laboratories are furnished on the Table 8 and Table 9 respectively.

Table 9. List of foreign commercial Laboratories web sites

Table 10. List of foreign organizations web sites

Forensic anthropology

Forensic Anthropology is the application of the science of physical anthropology in the legal procedures. A forensic anthropologist can assist in the identification of deceased individuals whose remains are decomposed, burned, mutilated or otherwise unrecognizable. Here in this section, details of websites related to Forensic anthropology are furnished on the Table 11.

For	Amèri	Bant-Broard of	Ь	http://www.wheetailchiderectuil/anth/ABututoichotony	
1.01	Forens	ic Anthropology		up. J. J. In y Web statistic yvar krottning torenbac bolany	
Cri	Interna Me Sco Cranio	tional Association for ne Botanicals facial Identification	ht	tp://www.botany.org/iPlantTalkingPints/ctin	
го (Вс	Albert	A. Midori - Ph.D. socięty of America)	e.	http://www.uncwil.edu/people/albertm	
Fo	rorens ensic Forens	aleontology	h	tp://www.crimeandclues.com/pollen.htm http://medstat.med.utah.edu/kw/osteo/	
ΑI	New W	ay to Catch Crooks		forensics/index.html	
	Forens Univer	Forensic botany sity of Tennessee		to assist Judiciary. Here in this section, d	etails of
	Bodies	of Evidence science in the resolution of leg	ıpj gal	http://www.channel4.spja/2history/ guestions in order	manca
	Forens	ic Anthropology FAQ Ta t	ole	ht2p1/istperforensie wordny adhatetm/ torsinesic.htm	
	Forens				
	i oreno				
	Online				
	Osteoi				
	Death'				
	Midwe Forens	est Bioarchaeology and G.V.N. Reddy <i>et al.</i> Indian Journal of Forensio IC Anthropology	c M	http://www.luc.edu/depts/anthropology/BARFAA edicine and Pathology. Jan - March 2009; Vol. 2 No. 1	29
	Associ	ation			
	LSU Fa	aces Lab		http://www.lsu.edu/faceslab/	

Forensic chemistry & forensic toxicology

Forensic chemistry is the application of principles of chemistry in the enforcement of Law. Forensic toxicology is the application of toxicology in legal procedures. Previously there are only a few 'pure'11 toxicology sites in the Web but now we have a very good number of websites related to toxicology and some of them are furnished here in Table 13.

Table 13: List of Forensic Chemistry and Toxicology related web sites

Criminalistics and trace evidence

Criminalistics and Trace evidence are both catch-all terms that apply to all types of physical

evidence that may be circumstantial evidence in the trial of a case. List of criminalistics and trace evidence related websites are given on Table 14.

Ethics in forensic science

sites are furnished on Table 15.

List of ethics in Forensic science	related web		
Latent Print Examination:	http://onin.co	m/fp/	
Fingerprints, Palm prints and Footprints15. List of	web sites rel	ated to ethics in forensic science	
Scientific Working Group on Friction Ridge Analysis.	http://www.s	wofast.org/	
Study and 'Ethics in Science		http://www.chem.vt.edu/chem-ed,	/ethics/
Marks Wor <mark>American Society of Crime Lab E</mark> Code of Ethics	Directors	http://www.ascld.org/ethics.html	
Ridges and American Academy of Psychiatry	y and the	http://www.forensic-	
Law Ethical Guidelines for	, 	psych.com/articles/art Ethics.html	
Optical Min The Practice of Forensic Psychiat	ry		
Tool marks and ballistics		cartridge case or other than amn	nunition,
Forensic Fiber Examination Guidelines Ballistics is the 'study of Projectile i	http://www.fl n motion'12 Oc.htm	pi.gov/hpg/hab/tfsc/d546kies116/appj/appl/howfkie marks are the marks left on an item	arm. Tool by a tool
Hairs, Fibers niterand with determining tha	http://www.fl http://www.fl .htm	pi.g0%/hil/1at/186%Basitssu/filn/2000/Xithinat furnished on Table 16.	ection are
Microscopy of Hair Part 1: A Practical Guide and Manual for Human Hairs	http://www.fl /2004_01_resea	pi.gov/hq/lab/fsc/backissu/jan2004/research arch01b.htm	
Microscopy of Hair Part II: A Practical Guide and Manual for Animal Hairs	http://www.fl /2004_03_resea	pi.gov/hq/lab/fsc/backissu/july2004/research arch02.htm	
Minerals Under the Microscope	http://www.g	ly.bris.ac.uk/www/teach/opmin/mins.html	

Crime Scene Investigation

Crime scene investigation involves the use of scientific methods, physical evidence, detective reasoning and their interrelationship to gain explicit knowledge of the series of events that surrounds the commission of a crime13. Here in this section, details of crime scene investigation related web sites are furnished on Table 17.

Table17. List of crime scene investigation related web sites

Forensic entomology

Forensic entomology is the science of using insect evidence to uncover circumstances of

interest to the law, often related to a crime14. List of the Forensic entomology websites is given on Table 18.

Forensic serology

Forensic serology is the application of study of

blood, semen, saliva and other body fluids to legal matters. List of web sites related to this section are furnished on Table 19.

Table19. List of forensic serology related web sites						
Forensic-Sentologyogy.com	http://fac	hlttp:///wcvedut/streasinen/d25/425leoth?.htm				
Serology. It's in the Blood http://www.trutv.com/library/crime/criminal_mind /forensics/serology/1.html						
American Collection and Preservation of Blood Evidence from Crime What Hap	http://www.crime-scene-investigator.net/blood.html					
Forensic Fact File: Forensic Serology Forensic E	http://wv what.asp?j	p://www.nifs.com.au/FactFiles/serology/ nat.asp?page=what&title=Forensic?Serology				
Insect Invergences						
About Forensic Entomology		aboutfe.htm				
A Brief Hist Fryensic Pensionaliting Mark Benec korGastifi@NForAmity	ology Higløgiðase	http://www.Wenkere.comhichiennshighly va d on the particular to each person. The relat	riable and ed websites			
The TestinidenyibicaBiogsof certain ger	netic sequen	htspalled www.maill.com/obracl/techrep/ techrep.htm				
Forensic Biology Laboratory - Univ Alabama at Birmingham	versity of	http://www.dpo.uab.edu/~jwells/ FBL.html				
Forensic Entomology: What the Blowfly Saw		http://tlc.ousd.k12.ca.us/~acody/ forensic.html				

Forensic Science - Terminology

List of web sites related to Forensic science

Forensic DNA Glossary	http://www.forensicdna.com/DNAGlossary.htm
Glossary of Terms of the	http://www.vifsm.org/assets/glossary.html
Death Investigation	
Blood Stains Pattern Analysis	http://www.iabpa.org/Terminology.pdf
Terminology	
SWGFAST Glossary	http://www.swgfast.org/Glossary_Consolidated_ver_1.pdf
Glossary of Typography	http://www.counterspace.us/typography/
On-Line Medical Dictionary	http://cancerweb.ncl.ac.uk/omd/
Forensic Botany Glossary	http://myweb.dal.ca/jvandomm/forensicbotany/
	glossary.html

Table 21. List of forensic science terminology related web sites

Forensic Odontology

Odontology is the study of teeth. Forensic odontology is a specialized field of dentistry where in a death investigation; identity has sometimes been established through analysis of the teeth and accompanying dental prosthetics, fillings and compounds.15

List of the websites related to Forensic Odontology or Forensic Dentistry has been given on Table 22.

Table 22. List of forensic odontology / dentistry related web sites

Forensic Dentistry Online	http://www.forensicdentistryonline.org/
Australian Society of Forensic Dentistry	http://www.uq.edu.au/asfd/
Bureau of Legal Dentistry	http://www.boldlab.org/
Forensic Odontology:	http://www.uq.edu.au/
Universit <mark>y of Queensland</mark>	
Odontology: Detection of Child Abuse	http://www.ada.org/topics/abuse.html
American Board of Forensic Odontology	http://www.abfo.org/
Forensic Odontology Gopher	gopher://ucivnokia.tvm.lu.se/
Issues in Human and Animal Bite Mark	http://www.forensic.to/webhome/
Managem <mark>ent</mark>	bitemarks/
The British Association of Foronsic	http://www.bafo.org.uk

The British Association of Forensic Questioned document examination

Odontology A document is any material that conveys a message whether visible, invisible or partially visible. Where a question, such as authorship or authenticity, arises in reference to a document, the document should be submitted to a question

http://www.bato.org.uk document examination16. The application of alveys a lied sciences and analytical techniques to quesartially tions concerning document is termed Forensic ship or document examination17. List of Web sites rerument, lated to this section is given on Table 23.

Medico legal death investigation

Medico legal death investigation is the application of medical knowledge in the

investigation of a death in a suspected crime scene. List of web sites related to medico legal death investigation are furnished on Table 24.

Table 24. List of medico legal death investigation related web sites

American Board of Medico-legal Death	http://www.slu.edu/organizations/a
Investigators, Inc	bmdi/
CDC Guidelines for Death Scene Investigation of	http://www.cdc.gov/mmwr/previe
Sudden, Unexplained Infant Deaths	w/mmwrhtml/00042657.htm
"Death Investigation:	http://www.ncjrs.gov/pdffiles/
A Guide for the Scene Investigator"	167568.pdf
A publication of the National Institute of Justice	
Medico legal Death Investigation System:	http://books.nap.edu/openbook.php
Workshop Summary	?record_id=10792&page=38

Forensic pathology

Forensic pathology is a branch of medicine concerned with determining the cause of death

at cellular level, usually for criminal and civil law cases in some jurisdictions18. List of web sites related Forensic pathology is given on Table 25.

Table 25. List of forensic pathology related web sites



Forensic photography

Forensic photography (sometimes referred to as forensic imaging or crime scene photography) is the art of producing an accurate reproduction of a crime scene or an accident scene for the benefit of court or to aid in the investigation. It is a part of the process of evidence collecting. It provides investigators with photos of bodies, places and items involved in the crime. List of web sites related to forensic photography is given on Table 26.

Grivensi Sve	ne and Evidence Photography	http://www.crime-scene-investigator.net/csi-	
		photo.html	
Crimed SEe	ne Photography Requirements	http://www.geocities.com/cfpdlab/csphoto.htm	
of Crimina	al Investigative	1	
Bastereyin	e Scene Photography	http://www.scetv.org/crimetocourt/Special%	
University		20Pages/photography.htm	
Geipaetsse	ne Photography 1.01	http://www.brazoria-county.com/sheriff/id/	
College of		photography/	
Eorensic P	hotography Certification	http://www.theiai.org/certifications/imaging/	
Forensic P			
Latent Pri	nt Photography	http://www.redwop.com/minutiae.asp?action=	
		showArticle&ID=204	

Table 26. List of forensic photography related web sites

Forensic psychology

Forensic Psychology is the application of principles of psychology and knowledge in various medico legal situations to resolve the issues. Typical issues include child disputes, child abuse & neglect, assessing personal capacity to manage one's affairs, matters of competency to stand trail, criminal responsibility, and personal injury and advising judges in matter relating to sentencing regarding various mitigants and actuarial assessment of future work. List of web sites related to this section is given on Table 27.

Forensic psychiatry

Forensic psychiatry is the application of knowledge of psychiatric medicine in medico

legal cases. It encompasses the interface between law and psychiatry. List of web sites related to Forensic psychiatry are furnished on Table 28.

Table 28. List of forensic psychiatry related web sites

Entertainment

From the entertainment point of view, many serials like CSI, CSI Miami and Forensic files have

basic concepts of Forensic science knowledge. List of web sites related to this entertainment section related web sites are furnished on Table 29.

Autopsy (HBO)	http://www.hbo.com/autopsy/
CSI: Crime Scene	http://www.cbs.com/primetime/csi/
Investigation (CBS)	main.shtml
CSI: Miami (CBS)	http://www.cbs.com/primetime/csi_miami/
	home.shtml
Forensic Files (Court TV)	http://www.courttv.com/onair/shows/
	forensicfiles/
The New Detectives and FBI	http://dsc.discovery.com/fansites/onthecase
Files (Discovery Channel)	/onthecase.html

Table 29. List of forensic science entertainment related web sites

Forensic art

Forensic art is a law enforcement artistic technique used in the identification, apprehension, or conviction of wanted persons.

Forensic art encompasses several disciplines including composite art, image modification, age progression, post-mortem reconstruction and demonstrative evidence. List of web sites related to Forensic Art is given on Table 30.

Table Ju. List of forelist art related web sites	Table 30.	List of f	forensic	art rela	ated w	eb sites
--	-----------	-----------	----------	----------	--------	----------

Forensic science resources in I	ndia	Bureau, Serologist to the Government o	of India,
Although our ancestors did not	know forensic	and few scientific divisions attached to t	the CID
science in its present form, scienti	fic methods in	in few states. Now we have full fledge	ed four
investigation of crimes. Its detail	ollowed in the	central Forensic Science Laboratories, N	lineteen
East Anti-found in: Kautilya's 'Arthashastr	a reference is	State Forensic Science Laboratories20 an	nd One
written about 2300 year's ago19. Til	l now, in India	21, 22, 23. Recently Sri Narendra Modi. Th	he Chief
Forensic Apteworkstippse has not been s	intep://tell.88ce.	OMedu/doron dicharat has announced t	that his
importance. With the advancem	ent of science	government is planning to establish a F	Forensic
science has become a multidiscir	http://www.io linary subject	Precision State 24. Son	me FSLs
SculpturinEngligies The application of	Brience and sc	have their own Websites, where as the other	ites are
technology in the detection and ir	vestigation of	_attached to the concerned State Police Aca	idemies.
Forensic Aritist and the administration of	inttise is www.cr	ri meiscang le focuses on a few Indian F	orensic
The Statute of Limitations	investigator.net	t/Scirensicargistilations / Laboratories w	veb sites
Invostigaindependence we had a few Labor	atories to deal d	and includes tew websites related to educ	cational
Computer Graphics for Forensic Facial	ical evidences	few Forensic science laboratorie	es and
viz, Chemical examiner's Laborato	y, Fingerprint	Organizations is given in Table 31.	

Directorate Of Forensic Science (DFS),	http://dfs.gov.in/	
Ministry of Home Affairs		
Bureau of Police Research and Development	http://bprd.nic.in/	
Finger Print Bureau - CID, West Bengal, India	http://cidwestbengal.gov.in/special- units-finger-print-bureau.php	
Department of Explosives	www.explosives.nic.in/	
The Central Forensic Science Laboratory, CBI	www.cbi.gov.in/cfsl/about.htm	
National crime records bureau	http://ncrb.nic.in/cfpb.htm	
The AP State Forensic Science Laboratory	www.apfsl.org/	
Haryana forensic science Laboratory	http://fslharyana.nic.in/	
Uttar Pradesh forensic science laboratory	uppolice.up.nic.in/forensic.html	
Madhya Pradesh Forensic Science Laboratory	http://www.mppolice.gov.in/dynamic /branches/fslcid.htm	
Himachal Pradesh Forensic Science Laboratory	http://himachal.nic.in/home/Forensic s/ Organisation.htm	
Directorate of Forensic science, Assam	http://www.dfsassam.org/	
Tamil Nadu State Forensic Science Department	http://www.tn.gov.in/tamilforensic	
Chemical examiner's laboratory, kerala	http://kerala.gov.in/dept_chemicalex m/chemicalexam.htm	
National Bureau of Investigations (NBI)	www.nbiindia.com/index.htm	
India's first private forensic science lab (Truth labs)	http://truthlabs.org/default.aspx	

Table 31. List of forensic science laboratories and organizations in India

Courses offered by various universities and colleges in India

At present very few universities/colleges in India offer Forensic science courses at

undergraduate and postgraduate level, whereas in the developed world this number is very large 25. List of Universities and colleges are furnished on Table 32.

Table 32. List of universities and colleges

Indian Congress of Forensic Medicine	http://www.icfmt.org/
And Toxicology	
Medico- legal update	www.medicolegalupdate.org/
Anil Aggarwal's Internet journal of	www.geradts.com/anil/ij/indexpapers.htm
Forensic Medicine& Toxicology	
Journal of Postgraduate Medicine	www.jpgmonline.com/
The Indian Journal of Criminology	www.nicfs.nic.in/publications.htm
& Criminalistics	
Journal of Punjab Academy of	
Forensic Medicine & Toxicology	www.indianjournals.com
Indian internet journal of	
Forensic medicine & Toxicology	
Journal of the	
Indian society of Toxicology	
Journal of Indian Society of	
Forensic Medicine	
Indian Journal of Forensic Science	www.indianajournals.com/journals%20
Indian Journal of Criminology	
Indian police Journal (The)	

Table 34. Forensic science journals in India

Miscellaneous Websites

furnished on Table 35.

List of Miscellaneous web sites in India are

Forensic accounting in India		www.indiafarensic.com	
Forensic H	ntomology India	www.forensicentomologyindia.com	
Forensics	Guru: Computer Forensic	www.forensicsguru.com	
Solutions	for India		
All about	forensic science.com: Forensic	www.all-about-forensic-science.com/	
Science in	India	forensic-science-in-india.html	
Forensic I	ndia.com:	www.forensicindia.com	
Indian gat	e way of Forensic Medicine		
Dental Inc	lia	www.dentalindia.com/forensic.html	

Impact of the web and its limitations in forensic science

One of the impacts of the Internet is it may spur an increase in knowledge of science and technology in developing countries. Use of the Internet is more in developing countries rather than developed ones. Enormous range of tools and literature can be accessed by the use of Internet because of its widespread nature. Many journals are published online, which have lower costs than the printed ones. An Organization named High Wire Press, a not-for-profit body set by Stanford University (hwmg.stanford.edu/ developing.html) 26. This kind of free flow of information has enabled any one with good computer skills to setup a site on specific topics. Inaccurate information may be found in certain Web pages but a major portion of information is always true.

Limitations of the Internet come into picture only when there is a necessity to transmit information that is confidential. Hacker who tries to hack the system can easily get into such information's, which may lead to misusage. Another limitation of the Web is the security issue. Computer virus is basically a computer program that it returns to attach itself to other programs and replicate whenever those programs are executed. Most common viruses that affect computers today-viruses such as concept, Trozan, Nuclear, Showoff, Adom, Wazzu and Laroux are Micro Viruses. The most important weapon to combat a computer virus is developing a competent Anti-virus strategy. Booting from a clean write-protected diskette is the only way to start up the system without any viruses in memory. Another way of combating a virus problem is having an up-to-date authenticated antivirus software, which are updated to deal with emerging problems and to rectify them.

Conclusion

The recent developments in Forensic science can be easily accessed by using Internet in a proper object orientated search. Various useful databases already exist and many are added to it every day. This makes the usage of web even more important from the point of gaining valuable information. Researcher around the world can come into contact with each other and can share, compare, update and collate their research easily. From one point of view, the web is highly useful in getting valuable information from images and videos that are shared over the Internet. This has an added advantage over any other communication media because 'real time' information can be gathered which consumes less time in accessing to the new events that are happening around the world. Access to the web is simple, but handling enormous quantity of information is the really a tough job. Confidentiality and security are major concerns, hence safe guards have been built into many of the web applications with 128 bit encryption used by Netscape and Microsoft, and credit card transactions are becoming safer day by day. It is high time that Forensic Scientists should learn using of the web to the greatest extent in order to integrate information for assisting the Criminal Justice System for the welfare of the society.

References

- Biermann, J.S., Golladay, G.J., Greenfield, M.L.V.H. and Baker, L.H. Evaluation of Cancer, information on the Internet. Cancer, 1999; 86: 381-390.
- BBC News Online. Available from http://news2.thls.bbc.co.uk/hi/english/ sci/tech/newsid%5F556000/556229.stm.
- Ceelen, W.P. and Waele, J.D. (1999).
 Surgeons and the Internet. Eur. J. Surg, 1999; 165: 93.
- Aggarwal A, Setia P, Gupta A.
 "The Internet How Toxicologists can use it to their advantage", Anil Aggarwal's Internet Journal of Forensic Medicine and Toxicology, 2005; 6(1).
- H. K.Bid, Ajay Kumar and R. D. Mittal. "Internet Resources and Biochemistry", Indian Journal of Clinical Biochemistry, 2006, 21(1): 137-141.
- 6. Crumlish, C. Symbols in the Internet Dictionary. California: Sybex Inc., 1995; 1-3.
- Madeleine R. Nash and Richard L. Faranio, "Internet Resources in Legal Medicine and Forensic science", Medical Reference Services Quarterly, 1999; 18(1); 59-68.
- 8. Killoran, K.B. Forensic science: A library research guide. Reference Services Review, 1996; Winter: 15-30.
- Cynthia Holt, "Forensic science resources on the Internet" Issues in Science and Technology Librarianship 37 (2003) (cited 1 Sept.2003) 10. C & R L News, "Criminal investigation and Forensic science: Sources for Scholors and Aficionados", 2003; 64(9).
- 11. The World Wide Web Virtual Library: Forensic Toxicology. Available: http:// home.lightspeed.net/~abarbour/vlibft.html
- 12. Brenner, J.C. Forensic Science Glossary. Boca Raton, Florida: CRC Press LLC. available with http:// www.forensicnetbase.com/books/656/ cr1196fm.pdf, 2002.
- 13. Carpenter, R. S. Forensic Science resources. Available with http:// www.tncrimlaw.com/forensic
- 14. American Board of Forensic Entomology.

Available from http://www.missouri.edu/ agwww/entomology/

15. Virginia Institute of Forensic Science and Medicine.

2003. Glossary of forensic science terms related to a death investigation. Available with http://www.vifsm.org/overview/glossary.html

16. Mid-Atlantic Association of Forensic Scientists. Questioned Document Section.

Available with http://www.maafs.org/ questioneddocuments.htm

17. Document Examination Consultants, Inc. Selecting a Forensic Document Examiner.

Available with http://www3.sympatico.ca/ lindblom.doc.exam/selecting/ selecting.html.

- Forensic pathology from Wikipedia, the free encyclopedia Available in http:// en.wikipedia.org/wiki/Forensic_pathology
- 19. R.K Tewari, K.V Ravikumar, History and development of forensic science in India,

Journal of Postgraduate Medicine, 2000; 46(4): 303-8.

20. Forensic Science Institutions in the in the country and Law relating to scientific evidence www.bprd.gov.in/writereaddata/linkimages/ 27026324831.pdf

- "Country's first private forensic science lab inaugurated". The Hindu, Hyderabad, Monday, Oct 22, 2007.
- 22. "Hyderabad Gets Private Forensic Lab". The Times of India, HYDERABAD,22 Oct 2007, 1125 hrs IST, PTI.
- 23. "India's first independent Forensic Lab launched". WebIndia123.com, Hyderabad Sunday, Oct 21 2007 IST.
- 24. "Gujarat to have Forensic Science University- Modi". India edunews.net, June 27, 2008, Available with http:// indiaedunews.net/Gujarat/ Gujarat_to_have_forensic_science_university-_ Modi_4844/25. DR. T. R. BAGGI, "Forensic science – A Challenging Career". The Hindu, Online Edition of India's National Newspaper, Education plus Hyderabad, Monday, Jun 30, 2008 http://www.thehindu.com/thehindu/ edu/ 2008/06/30/stories/ 2008063051270300.htm
- 26. Butler, D. Internet may help bridge the gap. Nature, 1999; 397: 10-11.

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Medico-legal Aspects of Colour Blindness and Correlation of the same to Blood Groups

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Abstract

A study of colour blindness and its correlation with different blood groups was undertaken in 384 medical students (219 males and 165 females). Colour blindness was studied by using Ishihara's chart. In blood group AB, in males, and group B in females, the incidence of colour blindness was significantly higher. We also observed a slightly higher incidence of colour blindness in females.

Key Words: Colour Blindness, Blood Group.

Introduction

It is now well established that perception of colour is a function of the cones. A defect in this function would lead to a defect in colour recognition. Abnormal colour vision is usually present as an inherited anomaly⁽¹⁾. Colour blindness could rarely be of the acquired type⁽²⁾ due to damage to the retina &/ or optic nerve following intoxication and hypoxia.

In the Caucasian population, the incidence of colour blindness is reported to about 8% in males, and 0.4% in females (1, 3) while Seal has reported a slightly lower incidence of 3-4% in males⁽²⁾.

It is now shown that people possessing a specific blood group do show preponderance towards particular diseases,⁽⁴⁾ namely; group A people showing an increased susceptibility to gall stones, liver cirrhosis, tumours of salivary glands, stomach, pancreas and ovaries. Duodenal ulcers are more common in Group 'O' people. An increased incidence of myocardial infarction and diabetes mellitus is found in group A individuals.

This study undertaken to investigate, if there was a preponderance of colour blindness in

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Professor & HOD, Dept. of Physiology Pad. Dr. V. Vikhe Patil Foundation's Medical College & Hospital, Ahmednagar. 414111 people belonging to a specific blood group, as both entities are genetically determined.

Material and methods

384 student volunteers of this college were tested for colour blindness, using Ishihara's Chart. and following the procedure laid down in the chart. Of these, 219 were males and 165 were females. Their age group was 17 years to 22 years, with a mean age of 18.6 years (S.D.± 1.54). The blood groups of these volunteers were determined by the standard tile method, using standard Antisera manufactured by Span Diagnostics Ltd. (Surat - Gujarat).

Results

In the present study we tested 384 volunteers for color blindness.

Table 1 & Fig. 1 show the percentage distribution of these volunteers into different blood groups. Table 2 & Fig. 2 show the incidence, in percentage of colour blindness in the different blood groups. The incidence of colour blindness as detected in this study was 6.0% in the total population. The incidence in males was 9.1% and in females it was 0.6%. The observed defect in the colour vision was red green blindness. Blue blindness was not found. Table 3 shows a comparison of the percentage distribution of blood groups, as reported by other workers and in the present study ^(1,7, & 8).

Discussion

The percentage distribution of blood groups is different from that reported by other workers ^(1, 7, & 8). This could be possibly due to the fact that the students of this institution come from all parts of the country, and therefore, represent a mixed ethnic group.

The total incidence of colour blindness is similar to that reported by Katti et al,⁽⁵⁾ but in our study we have surprisingly found a slightly higher incidence in females as compared to other studies. This is our observation. We have carried out the test for colour blindness as given in the Ishihara's chart.

A further study (which is planned) of this same parameter may help to confirm this finding.

The second very interesting point brought to light in this study was that the percentage incidence of colour blindness was higher in male subjects belonging to blood group AB as compared to the total incidence. In females, the incidence was higher in subjects of blood group B and O. On statistical analysis, (using X2 test) it was found that this difference was statistically significant. (P<0.01). in group AB males and group B females. It has been shown in various studies that 2% of colour blind males are dichromats who have protanopia or deuteranopia, and about 6% are anomalous dichromats in whom the red sensitive or green sensitive pigment is shifted in its spectral sensitivity. These abnormalities are X-linked recessive characteristics.

Medico-legal aspects

This study was carried out on medical students. Colour blindness will affect their future to some extent e.g. Colour blind students will have difficulty in Histopathology as they will not be able to distinguish the staining properties of different cells.

Privileged Communication "This is a bonafide communication given by a doctor, to the authorities, by virtue of his duty to protect the interest of community or society". Thus, if it is known that a student is colour blind, it may become necessary to inform some authorities, if required, in the future. Colour blindness can be one of the identity measures of a person.

Acknowledgement

We are extremely grateful to the Deputy Director, P.D.V.V.P.F'S Medical College Ahmednagar for his permission to carry out the present study. We also very much grateful to Principal, P.D.V.V.P.F'S Medical College Ahmednagar for his permission to carry out the present study. We express my thanks to statistician for his help and guidance in statistical analysis. We are also indebted to all teaching and non teaching staff of physiology department for their constructive valuable help.

Last, but not least, we must thank all the students who were subjects of this study for their co-operation and assistance, without whose help the present study could have been incomplete.

Table 1: Percentage (No.384) distribution ofdifferent blood groups



 Table 2: Percentage (No.384) incidence of colour blindness

Table 3: Percentage distribution of blood
groups as per textbooks

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