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Editor-in-Chief : Prof. R.K. Gorea

From Editor's Desk

It is my privilege to present to you the fourth volume of the Journal of Punjab Academy of Forensic Medicine and Toxicology for the year 2004. I thank all the members of PAFMAT who have evaluated the previous editions and given me suggestions to improve upon the previous issues. I am overwhelmed by the response of the readers not only from Punjab but from all over India. Since this journal got ISSN number it is getting articles from all over India. I thank all the contributors and hope they will continue this patronage and will help me to bring it to international standards by all means. You will find the new pattern of this journal as per our national journal of Indian Academy of Forensic Medicine. I thank Dr. Amandeep Kaur, Managing Director of Amandeep Hospital, Amritsar who has contributed to make the publishing of this journal possible. I also thank our worthy principal Dr. Kiranjeet Kaur who has always encouraged me to promote such academic activities. I will be failing in my duties if I do not thank my departmental colleagues who render me all possible help to continue with this project of bringing this journal to you in the present form.

2020 – A VISION FOR FORENSIC MEDICINE

We need a dream which will stir the imagination of all the forensic medicine experts. It should be a motivating force for them. We should identify the bottle necks and suggest their possible solutions. To meet this objective this is my vision statement for the year 2020.

There have been a lot of progress in the field of forensic medicine and toxicology during the 20th century and which is keeping its pace in the 21st century. But if we compare this progress with the other fields of medical specialties, I feel our speed requires a lot of acceleration. Are we sure where we want this subject to be? Do we want it at the top or let it linger on the present condition which is definitely not what we will like it to remain?

We must know what our strengths are and what are our weaknesses? We will have to consolidate our strengths and remove our deficiencies. Here I am presenting a range of interesting possibilities.

The biggest challenge is to throw away the garb of doom's doctor. I will be happy if I have not to explain everybody whom I meet that what is Forensic Medicine. It should be known to everybody what forensic medicine is; and this will be possible only if we will do our duty sincerely, honestly and with a dedication. In this way we will give the service to the society with a difference and they will realize that doctors of forensic medicine are our real friends who provide us good services at the most crucial times.

We will have to change the outlook of the mortuaries. We will have to try that mortuaries are not located at the dirtiest or dead location of the hospital. It should be like any other department of the hospital, neat and clean. It should not be the last priority of the administration of the hospital but the first priority to provide the ultimate service to the humanity with a dignity. When the bodies are brought to the mortuaries they should be received in the gentlest way possible keeping in mind the distress of the people who are bringing it. They are under the greatest shock of their life and they should be handled with sympathy and affection. This can be best done by the forensic nurses rather than the uneducated class IV employees or the sweepers of the department. There should be either cold storage rooms or cold chambers to keep the dead bodies. They should never be put on the floor of the mortuaries perhaps that is inhumane. There should be good quality steel tables for dissection along with proper sterile instruments. We should take care of people working with us to protect them from the infectious and contagious diseases. If the dead bodies are mutilated we should reconstruct them before handing them over to their relatives. Those should be properly washed and properly draped and a little make up of the face will improve the appearances a lot. Preparing of the postmortem report should be computerized and report should be delivered immediately. Whole record should be computerized so that anybody needing copy of the postmortem report can get it at the click of the mouse. There should be facilities to embalm the dead body or keep the dead body after postmortem examination in the cold chambers if it is demanded by the relatives of the deceased. Procedure of the postmortem should be transparent. Facilities for radiological examination should be available itself in the mortuaries so that patients are not disturbed in the radiology department when dead bodies are examined in the radiology department.

All the investigations required at the postmortem examination should be available at the mortuary complex whether it is the chemical examination of viscera or histo-pathological examination of the viscera. I will suggest that a forensic science laboratory should be a part of the complex of the mortuary block. In such circumstances right from examination of weapons to DNA fingerprinting should be possible at the same locality so that there is no degradation of samples during transport and results can be provided at the earliest which will help in better investigation of the cases. There should be quality control to check the validity of the tests performed at different centers.

Clinical forensic medicine also needs a lot of improvement. There should be separate examination room for the victims of violence. Victims of violence also need privacy. There should be facilities for the first aid which can be easily provided by the forensic nurses. While doing this job they will also take care that valuable trace evidences which can help to solve the cases are not thrown to the trash bins or waste baskets.

Examinations of victims of sexual violence also need special care and sympathy. The victims should be examined in such a manner that they do not have to repeat the devastating experience again and again to everybody. There should be a cell where police officer, doctor, forensic nurse, social worker and a forensic psychiatrist should be there to listen, examine, treat and console the victim. Medicolegal examination report should be prepared there only and all the required samples should be preserved there. Colposcope and photographic facilities should be present to preserve the valuable evidences. We will have to dispose off the unwilling, grudging gynecologists in the most tender situations.

Toxicology needs a lot of improvement. There should be no hesitation to treat the patients of poisoning by the forensic toxicologists rather than general physician. Number of poisons is increasing day by day and so is the knowledge to diagnose and treat them. It will be a burden on the general physician to tackle all such patients particularly when medicolegal aspects are involved in all such cases. Facilities should be present there only to find out the type of poison and its concentration. Advanced equipment like gas chromatography will be very helpful for this and many precious lives can be saved. There should be a regular contact between treating doctors and the poison control centers of the locality by phones or internet and the required information may be available for all poisons at the click of the mouse.

As all other specialties are progressing well in the private circle; we will have to think that all services rendered by forensic medicine experts could be provided privately. Of course law will have to be amended in some situations. This is possible only if all forensic medicine experts give their services honestly and scientifically which will be able to stand the scrutiny of the time and the law. The competition provided by the private sector will act as a catalyst to improve the government services in the field of forensic medicine.

Medical education is another thrust area where a lot of improvement is required. There should be more practical training of the undergraduates and postgraduates. The students should attend more postmortem cases and medico-legal injury cases. They should be taken to the courts to make them understand what the courts want from the doctors. LCD projectors and computers with multimedia facilities should be available in the class rooms. Old generation teachers should be given computer training so that they become computer friendly.

In India investigation of criminal cases is done by the police personnel who have little knowledge of forensic medicine. I suggest that forensic medicine doctors should be involved with such investigations at all levels rather than seeking their opinion later on when all trace evidences have been lost. It is like crying over spilt milk. Forensic medicine experts should acquire the role of MEDICAL DETECTIVES. This role will create of new employment opportunities for the forensic medicine experts. They should visit the crime scene along with forensic nurses and police people and it will greatly increase the success of prosecution cases on the scientific basis. Old generation should work hand in hand with the young budding forensic medicine experts when zeal of the younger and experience of the elders will make a perfect combination to take this forensic medicine specialty to the new heights.

I hope this vision 2020 will arouse your interest and debate which will help us to refine it further in the years to come. Here I have presented some crucial issues for the forensic medicine experts and crucial decision points for the authorities and the governments to consider and evaluate to give this specialty a new glory within the next two decades.

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DETERMINATION OF SEX FROM HAIR

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ABSTRACT

For determination of Sex of a person, root sheath of hair can be used as it is easy to obtain and is non-invasive. Barr bodies identify female sex and male sex is identified by the presence of fluorescent Y bodies. In this study 50 cases (25 male and 25 females) were studied. Present study indicates that reliable sex identification is possible up to eight months when the samples are kept in a dried condition.

KEYWORDS: Sex Determination, Barr bodies, Y- bodies

INTRODUCTION

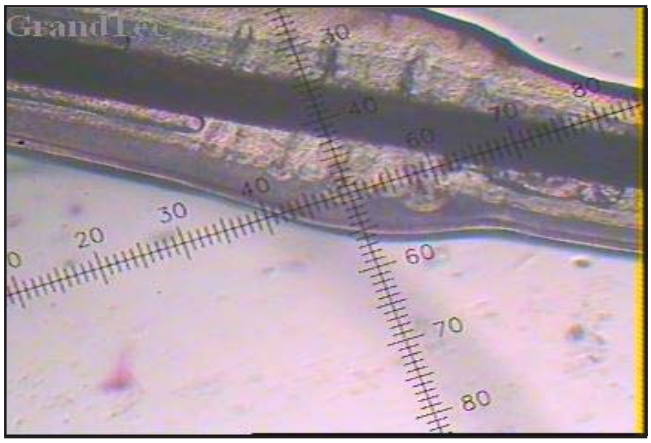
It is crucial for solving criminal case to determine sex of a person in many situations. When hairs are present as circumstantial evidence these can help in solving the puzzle when it may not be possible from any other evidence. Hair can found in hands of victim, on the lethal weapon and may be present on clothes, mattresses etc. In Forensic medicine sex from hair can be determined in decomposed bodies and mutilated bodies. Root sheath cells are resistant to autolysis hence sex determination can be done even in decomposed bodies. The sex chromatin i.e. Barr body was first found by Barr and Bertramm [1] in the nuclei of the nerve cells of cats. Zech [2] demonstrated that the distal portion of Y chromosome showed marked florescence after staining with Quinacrine mustard.

MATERIAL AND METHOD

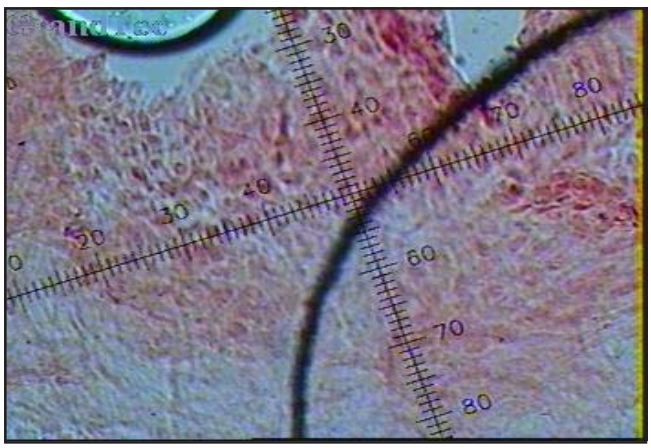
Hair are taken from scalp of 50 dead bodies (25 males + 25 females) coming to mortuary of Govt. medical college & Rajindra Hospital Patiala. Hair are plucked and kept in plastic bags under dry conditions. Hairs of females are stained by Aceto-Orcein staining and male hairs are stained by 0.5%. Quinacrine mustard. We studied the hair after monthly intervals.

The bulb of hair root in removed by the blade of scalpel and root sheath is slipped off the shaft. Root sheath is stained by Aceto-Orcein [3}. The material is compressed under a cover slip to obtain a monolayer of cells. Then in the suitable views 100 cells are studied under 40x and 100x objective of microscope for Barr bodies.

Root sheath cells are removed on the glass slide, fixed and stained by 0.5% Quinacrine dihydrochloride (sigma) for 5 min., then treated with citrate phosphate buffer (pH 5.5) for 15 minutes for colour conditioning and were mounted with phosphate buffer (pH 7.4) [4]. They are examined under 40 X and 100 X of Fluorescent microscope [Olympus Fluorescent microscope model BHF]



Photograph 1: Showing Intact Root Sheath



Photograph 2: Showing Barr Bodies

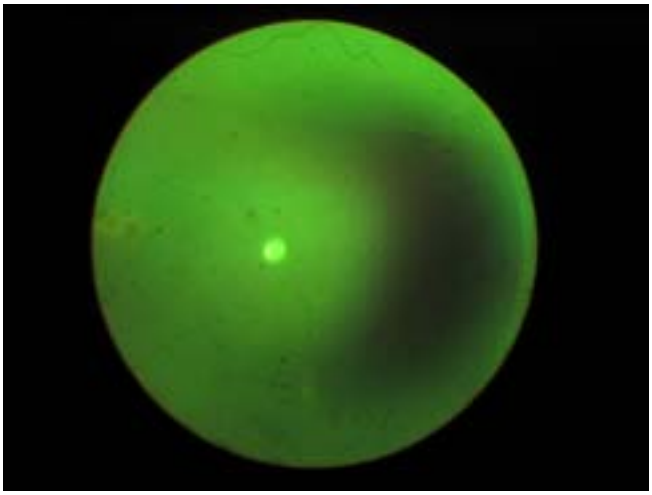


Photo 3: Showing flourescent spot in hair root cell 400x

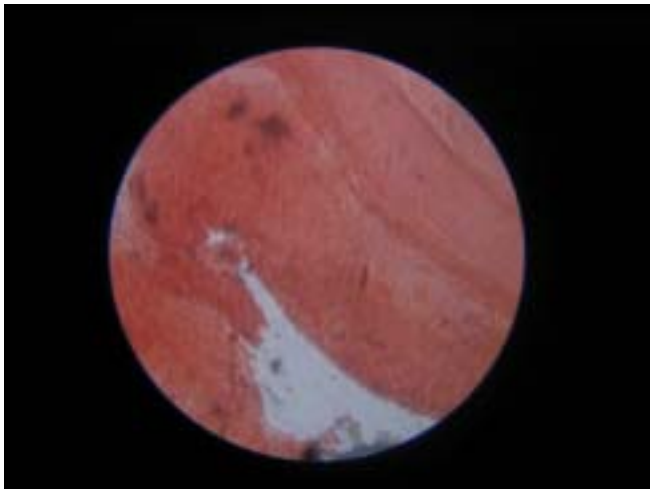


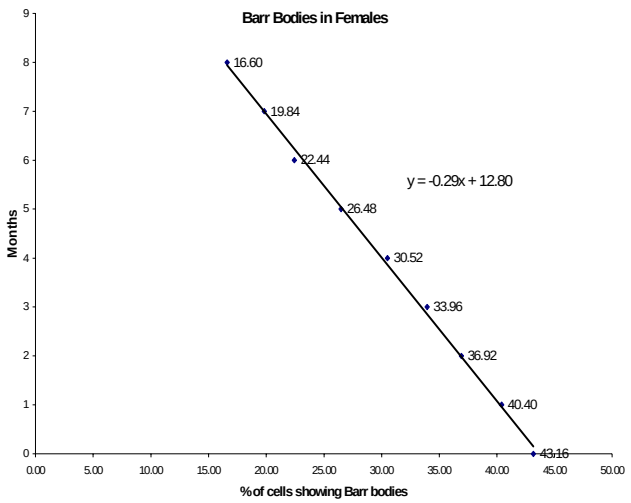
Photo 4: Showing microscopic view of hair root cell

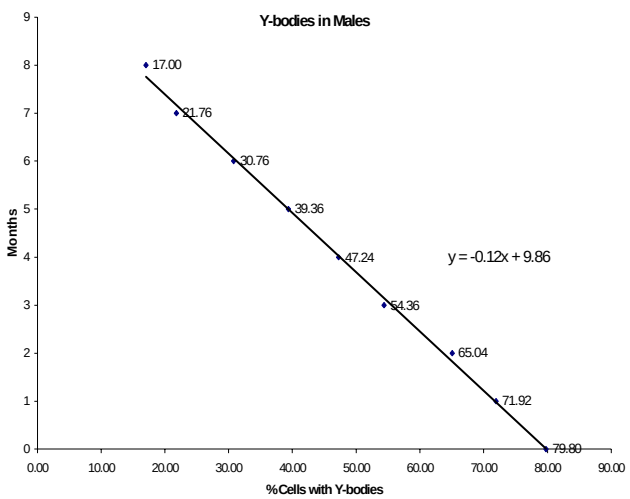
RESULTS & DISCUSSION

In the specimens of female hair, the Barr bodies are identifiable with the frequency of 22% to 47% of cells. The samples were examined for eight months at monthly intervals. It was found that in 18 cases sex could be easily identifiable up to 8 months. In one case it was not possible to determine sex after three months. The average range of fall of sex chromatin after one month was 45%-25% (average 35%), after two months 42%-18% (average 30%) after three months 38%-18% (average 28%), after fourth month 38%-20% (average 29%) after fifth month 38%-20% (average 29%), after sixth month 35%-20% (average 27.5%) after seventh month 30%-20% (average 25%), after eight months 29%-10% (average 19.5%).

In case of males Y chromatin is present in 70%-90% cells of male [5]. In this study the frequency of Y bodies in male hair is also 70%-90%. Reliable sex determination can be done up to eight months. The average range of fall of Y chromatin was after one month is 88%-52% (average 70%), after second month 86%-48% (average 67%), after third month 80%-36% (average 58%), after four months 76%-30% (average 53%), after five months 74%-25% (average 49%), after six months 70%-10% (average 40%), after seven months 60%-10% (average 35%) after eight months 50%-10% (average 30%). Dixon and Torr [6] were able to detect sex chromatin in the cells that remain unfixed on a blade for 5 weeks. Nagamori [7] was able to recognize sex from hair up to four weeks. Nagamori and Takeda [8] were able to distinguish male and female sex from hair up to 32 weeks.

In the present study reliable sex identification is possible up to eight months, if the samples kept in dried conditions.





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RADON IN THE ENVIRONMENT OF INDUSTRIALLY POLLUTED CITIES IN HARYANA

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ABSTRACT

Measurements of radon are important because the radiation dose to human population due to inhalation of radon and its progeny contribute more than 50% of the total dose from natural sources. In the present study radon monitoring has been carried out in the two industrially polluted cities of Haryana using alpha sensitive LR-115 type II solid-state nuclear track detectors. The potential alpha energy concentration (PAEC), radon levels (EEC), annual exposure, annual effective dose varied from 4.98 mWL to 20.54 mWL, 46.1 Bq m-3 to 190.3 Bq m-3, 0.20 WLM to 0.85 WLM and 0.79 mSv to 3.27 mSv in Panipat city and from 5.97 mWL to 21.17 mWL, 55.3 Bq m-3 to 195.8 Bq m-3, 0.25 WLM to 0.87 WLM and 0.95 mSv to 3.37 mSv in Faridabad city. The geometrical mean of overall annual inhalation dose in the Panipat city it was 1.61 ± 0.05 mSv, and in the Faridabad city, it was 1.94 ± 0.05 mSv.

KEY WORDS: Radon, Health, Thermal Power Plant, Particulate, SSNTDs, Coal

INTRODUCTION

There is a worldwide concern about the ever increasing pollution levels in major cities, Delhi, the capital of India being the fourth in the world due to rapid urbanization and industrialization [1]. Pollutants can occur both outdoors and indoors. Indoor air pollutants released from cooking fires, burning LPG, synthetic materials used for building and furnishing, use of chemical products, pesticides and household care products, and moreover from soil, water and building materials can be particularly hazardous to the health of the occupants as they are released in the close proximity to people particularly in modern houses and commercial buildings as they are more tightly sealed and there is less ventilation and outdoor pollutants mainly comprise those released by vehicles, industries, and thermal power plants[2-3]. The main pollutants are particulate matter, carbon monoxide, sulphur dioxide, volatile organic compounds, formaldehyde, suspended particulate matter (SPM), radon (a colorless, odourless but noble gas, which is radioactive and ubiquitously present. It poses grave health hazards not only to uranium miners but also people living in normal houses and buildings and at work place like coal mines, cement industry, thermal power plants) etc. Some of the major diseases caused by indoor pollutants are acute respiratory infections and lung and cardiovascular diseases are some of the major causes of death. The diseases caused by outdoor pollutants are cancer, respiratory diseases, lung diseases, eye problems, and allergies. There are various governmental organizations like central pollution control board (CPCB) and other state pollution control board which keep on monitoring the pollution levels in the big and polluted cities and recommending various preventive and safety measures. As per available literature, there is no agency as such which keeps record of the radon levels in the environment of these cities.

WHY RADON MEASUREMENTS?

Radon, which is a topic of public health concern, has been found to be a ubiquitous indoor air pollutant in homes to which all persons are exposed [4 -5]. Risk projections imply that radon is the second leading cause of lung cancer after smoking [6]. A relationship between lung cancer and inhalation of radon and its progeny has been demonstrated [7]. 222Rn, a progeny of 238U formed from the radioactive decay of 226Ra, is a colorless, odorless, electrically uncharged noble but hazardous gas which is radioactive, emits alpha radiation and decays with a half life of 3.824 days. Radon is present in trace amounts almost everywhere (indoor and outdoor) on the earth, being distributed in the soil, the ground water and in the lower atmosphere. The concentration of radon in the atmosphere varies, depending on the place,

time, and height above the ground and meteorological conditions.

When radon decays to form its progeny (218Po and 214Po), they can collect electrostatically on tiny dust particles, water vapours, oxygen, trace gases in indoor air and other solid surfaces. These dust particles (aerosols) can easily be inhaled and attach to the bronchial epithelium, produce a high local radiation dose. Alpha radiation being densely ionizing (high LET) can induce DNA double-strand breaks and the development of cancer. It has been estimated that the radon, largely in homes, constitutes more than 50% of the dose equivalent received by general population from all sources of radiation, both naturally occurring and man-made [8]. Radon is well established human carcinogen for which extensive data are available extending into the range of general population exposure. It is well known that exposure of population to high concentrations of radon and its daughters for a long period lead to pathological effects like the respiratory functional changes and the occurrence of lung cancer [9]. Various researchers have reported that exposure to high levels of environmental smoke at the workplace and in other public sector indoor settings are important risk factors for lung cancer risk in workers [10]. The quantification of individual radon exposure over a long time period is fundamental as it poses grave health hazards not only to uranium miners but also people living in normal houses and buildings and at work place in industry and consideration of changes of building materials and ventilation habits, which influence the radon concentration.

PRESENT WORK

The increased interest in measuring radon concentration in the environment of Panipat (290 24/ N and 760 59/ E) and Faridabad (280 24/ N and 770 18/ E), the two maximum polluted cities in Haryana due to heavy vehicular traffic and industrial units like thermal power plants is due to its health hazards and environmental pollution caused due to the burning of coal in thermal power plants. The thermal power plants in both of the cities that use fossil fuels are among the chief causes of acid rain releasing large volumes of pollutants into the air. A great deal of fly ash (coal cinder) is also released polluting not only the air but also land and water. It was lesser known hitherto until recently that the fly ash which is a by product of burnt coal is a potential radioactive air pollutant and it modifies radiation exposure. There is a growing concern over pollution and global warming caused by conventional power plants, which can adversely affect atmospheric processes that regulate the global energy and heat balance. This in turn may have serious implications for the stability of life on the earth. It has been reported by several researchers that the concentrations of the isotopes 238U and 226Ra become 3-5 times more than those in the coal itself in the coal slag and fly ash obtained by burning the coal in coal fired power plants [11-12]. Several researchers have reported radon levels in thermal power plants [11-13].

Keeping in view the environmental pollution caused due to the burning of coal in thermal power plants, in the present work, the radon levels were measured at various locations in the two cities. The radon levels measured at some locations were moderately high and thus not very safe from health point of view.

EXPERIMENTAL TECHNIQUE

For the measurement of radon and its progeny concentration in the environment of two cities, track etch technique was used which is simple and inexpensive. LR-115, type II plastic track detectors were fixed at various locations such that the sensitive side of the detector faced the environment. While placing in dwellings, the detectors were kept away from the walls to avoid the exposure from direct alpha emission from building materials. The exposure time of the detectors was three months. Proper arrangements were made to avoid settling of dust on the detectors, which could otherwise affect the radon concentration [14]. At the end of the exposure time, the detectors were removed and subjected to a chemical etching process in 2.5 NaOH solution at 600 C for one and half- hour. The tracks produced by the alpha particles, were observed and counted under an optical Olympus microscope at magnification 600 X. Large number of graticular fields of the detectors were scanned to reduce statistical errors.

The measured track density (Track/cm2/ day) was converted into potential alpha energy concentration (PAEC) in mWL and then into radon

concentration (EEC value) in Bq/m3 [15]. The annual effective inhalation dose from radon levels measured at various locations in the environment and dwellings was calculated following ICRP Publication [16], discussed elsewhere [17].

RESULTS & DISCUSSION

The table 1 shows the value of potential alpha energy concentration (PAEC), radon levels (EEC), annual exposure, annual effective dose in the environment of Panipat city and table 2 shows the value of potential alpha energy concentration (PAEC), radon levels (EEC), annual exposure, annual effective dose in the environment of Faridabad city. The potential alpha energy concentration (PAEC), radon levels (EEC), annual exposure, annual effective dose varied from 4.98 mWL to 20.54 mWL, 46.1 Bq m-3 to 190.3 Bq m-3, 0.20 WLM to 0.85 WLM and 0.79 mSv to 3.27 mSv in Panipat city and from 5.97 mWL to 21.17 mWL, 55.3 Bq m-3 to 195.8 Bq m-3, 0.25 WLM to 0.87 WLM and 0.95 mSv to 3.37 mSv in Faridabad city.

CONCLUSIONS

The geometrical mean of overall annual inhalation dose in the Panipat city it was 1.61 ± 0.05 mSv, and in the Faridabad city, it was 1.94 ± 0.05 mSv. The measurements indicate moderate to high levels of radon concentration at different locations in the environment of the two cities. The radon

Table 1. Potential alpha energy concentration, radon concentration, annual exposure and annual effective dose in the environment of Panipat City

S.No.	Location	PAEC (mWL)	Radon conc(Bq/m^3)	Annual exposure (WLM)	Annual effective dose (mSv)
1	PNP-1	5.6	51.9	0.23	0.89
2	PNP-2	7.47	69.2	0.31	1.19
3	PNP-3	9.34	86.5	0.38	1.49
4	PNP-4	11.2	103.6	0.46	1.78
5	PNP-5	13.07	121.1	0.54	2.08
6	PNP-6	12.45	115.2	0.51	1.98
7	PNP-7	13.69	126.7	0.56	2.18
8	PNP-8	20.54	190.3	0.85	3.27
9	PNP-9	17.43	161.2	0.71	2.77
10	PNP-10	8.71	80.6	0.36	1.39
11	PNP-11	9.96	92.1	0.41	1.58
12	PNP-12	7.47	69.2	0.31	1.19
13	PNP-13	4.98	46.1	0.20	0.79
14	GM ± SE*	10.09±0.35	93.43 ±3.22	0.41± 0.015	1.61 ± 0.05

*SE (standard error) = s/ÖN, Where s is SD (standard deviation) and N is the no. of observations.

Table 2. Potential alpha energy concentration, radon concentration, annual exposure and annual effective dose in the environment of Faridabad City

S.No.	Location	PAEC (mWL)	Radon conc (Bq/m^3)	Annual exposure (WLM)	Annual effective dose (mSv)
1	FBD-1	18.68	172.7	0.77	2.97
2	FBD-2	7.47	69.2	0.31	1.19
3	FBD-3	8.71	80.6	0.36	1.39
4	FBD-4	9.96	92.1	0.41	1.58
5	FBD-5	11.2	103.6	0.46	1.78
6	FBD-6	12.45	115.2	0.51	1.98
7	FBD-7	13.69	126.7	0.56	2.18
8	FBD-8	14.94	138.2	0.61	2.38
9	FBD-9	16.19	149.7	0.67	2.57
10	FBD10	17.43	161.2	0.72	2.77
11	FBD11	9.34	86.5	0.38	1.49
12	FBD12	19.92	184.3	0.82	3.17
13	FBD-13	21.17	195.8	0.87	3.37
14	FBD-14	8.71	80.6	0.36	1.39
15	FBD-15	5.97	55.3	0.25	0.95
16	GM ± SE*	12.21±0.32	112.96 ±2.96	0.50± 0.013	1.94 ± 0.05

*SE (standard error) = s/ÖN, Where s is SD (standard deviation) and N is the no. of observations.

concentration was high in close vicinity of coal area and fly ash area. It may be seen from the data obtained that fly ash and coal dust produced by grinding and burning of coal in various thermal power plants causes an increase in radon concentration. The results indicate that at certain locations, the inhalation dose is almost 100% more than that the Global average value [18]. In the light of these findings, the pollution in the environment may affect doses from external irradiation and the inhalation of radon decay products is significant from health point of view. Necessary steps should be taken to minimize the level of environmental pollutants so that there are no adverse effects on the indigenous populations.

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PROSPECTIVE STUDY ON ROAD TRAFFIC ACCIDENTS

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ABSTRACT

Road Traffic Accidents have been the bane of the bane of the modern civilization accounting for considerable loss to the nation. An epidemiological study on Road Traffic Accidents (RTA) was carried out in a district hospital. Various parameters like age and sex distribution, time of occurrence, time elapsed between occurrence and referral to the hospital, receipt of First -Aid, alcohol consumption, recovering and expiry of the victims, vehicles involved in RTA, types of Road Traffic Injuries(RTI), seasonal variation of RTAs were studied and valid exclusions were drawn.

KEY WORDS: Road Traffic Accidents, Road Traffic Injuries.

INTRODUCTION

With increasing population and increasing vehicular density and with meager infrastructure amenities, the 21st century is plagued by yet another important issue, Road Traffic Accidents (RTA), which had in fact become a slow modern pandemic and prescribing to a pattern of a secular trend of disease epidemiology.

Road Traffic Accidents(RTA) and Road Traffic Injuries (RTI) consequent to it are on the rise and are a matter of concern as far as the loss of life and limb of a RTA victim and as well as the psycho-socio-economic consequences of the event aftermath, on the RTA victim and his family. Everyday as many as 140,000 people are injured on the world's roads. More than 3000 people die and some 15,000 are disabled for life. It is estimated that in 2002, road crashes killed 1.18 million people and injured about 20-50 million more. Perhaps 5million are disabled for life.[1] By the year 2020, if current trends continue the annual number of deaths and disabilities from RTI will have risen by more than 60% to number 3 on WHO's list of leading contributors to the global burden of disease and injury. They were number 9 on the list in 1990. [2]

William Haddon, Head of Road Safety Agency, USA has pointed out that Road safety were associated with numerous problems each of which needed to be addressed separately.[3] Accidents therefore have to be studied in terms of an epidemiological model(agent, host and environmental factors) and analyzed in relation to time, place and person distribution.(descriptive study design)

MATERIALS AND METHODS

This study was conducted at the Government District Wenlock Hospital, Mangalore, Karnataka from 1st January to 31st December 2002. All the RTA cases referred to the casualty of the district hospital constituted the study population. A pre-tested proforma was used by the investigator for interviewing the RTA victim. When the condition of the victim did not warrant the interview, in case of severe injury, under the influence of alcohol, death etc., the relatives or the attendants were interviewed.

RESULTS

A total of 161 cases of RTA formed the study population which constituted around 34.6% of the total number 465 (100%) of medico-legal cases. There were 138 (85.7%) male and 23 (14.3%) female victims. Maximum number 37 (26.8%) of male victims were in the age group of 20-30 years while the maximum number 8 (34.7) of female. The highest number 41 (25.5) of victims were between 20-30 years of age followed by 35 (21.7%) victims in the age group of 30-40 years and 32 (19.9%) victims between 40-50 years of age. There were 5 (3.1%) cases of children under 10 years and 2 (1.2%) cases of old people above 70 years. (Table-I)

TABLE-1 - DISTRIBUTION OF RTA CASES AGE AND SEX WISE

Age group	Male(%)	Female(%)	Total(%)
0-10	4(2.9)	1(4.4)	5(3.1)
10-20	16(11.6)	3(13.0)	19(11.8)
20-30	37(26.8)	4(17.4)	41(25.5)
30-40	31(22.5)	4(17.4)	35(21.7)
40-50	24(17.4)	8(34.7)	32(19.9)
50-60	16(11.6)	2(8.7)	18(11.2)
60-70	8(5.8)	1(4.4)	9(5.6)
> 70	2(1.4)	0(0)	2(1.2)
Total (%)	138(100)	23(100)	161(100)

The RTA cases were divided into four slots i.e. morning (6.01am to 12.00 noon), afternoon (12.01 pm to 6.00 pm), evening (6.01pm to 12.00 midnight) and night (12.01am to 6.00 am). It was seen that maximum 54 (33.5%) of the RTAs occurred in the evening and the minimum 21 (13.0%) occurred in the night. Most 47 (34.1%) of the male victims were involved in the evening while most 0.8 (34.8%) of the female victims were involved during the morning hours. (Table-II)

TABLE-II - DISTRIBUTION OF RTA CASES AS PER TIME OF OCCURRENCE

Time of occurrence	Male(%)	Female(%)	Total (%)
Morning (6.01am-12.00noon)	37(26.8)	8(34.8)	45(28)
Afternoon (12.01 pm-6.00 pm)	36(26.1)	5(21.8)	41(25.5)
Evening (6.01pm-12.00midnight)	47(34.1)	7(30.4)	54(33.5)
Night (12.01am-6.00am)	18(13.0)	3(13.0)	21(13.0)
Total (%)	138(100)	23(100)	161(100)

Similarly the RTA cases were categorized season-wise in this part of the country viz., summer season (from month of March to May), rainy (June to October) and winter (November to February).It was observed that the maximum number 78 (48.5%) of RTAs occurred in rainy season, followed by 54 (33.5%) in winter and the least 29 (18.0%) in summer. (Table-III)

TABLE-III - DISTRIBUTION OF RTA CASES AS PER SEASONAL VARIATION

Season	Male (%)	Female (%)	Total (%)
Winter	46(33.3)	8(34.8)	54(33.5)
Summer	25(18.1)	4(17.4)	29(18.0)
Rainy	67(48.6)	11(47.8)	78(48.5)
Total (%)	138(100)	23(100)	161(100)

It was observed that maximum number, 29(18.0%) of cases were reported to the casualty within 1-2 hours of the accident and the least 6(3.7%) within 5-6 hours. Around 18(11.1%) cases were reported to the casualty after 24 hours. (Table-IV)

TABLE-IV - DISTRIBUTION OF RTA CASES AS PER TIME INTERVAL BETWEEN OCCURRENCE AND ARRIVAL TO THE HOSPITAL

Time interval(hrs)	Male (%)	Female (%)	Total (%)
0-1	18(13.0)	3(13.0)	21(13.0)
1-2	25(18.1)	4(17.4)	29(18.0)
2-3	19(13.8)	3(13)	22(13.6)
3-4	21(15.2)	3(13)	24(15.0)
4-5	12(8.7)	2(8.7)	14(8.6)
5-6	5(3.6)	1(4.3)	6(3.7)
6-12	14(10.1)	2(8.7)	16(10.0)
12-24	9(6.5)	2(8.7)	11(7.0)
24-48	8(6.0)	2(8.7)	10(6.2)
>48	7(5.0)	1(4.3)	8(4.9)
Total (%)	138(100)	23(100)	161(100)

Of the 161 (100%) RTA cases 49 (30.4%) received First Aid and 112 (69.6%) did not receive First Aid. Of the 188 (100%) male victims, 43 (31.2%) received First Aid and of the 23 (100%) female victims only 6 (26.1%) received First Aid. (Table-V)

TABLE-V - DISTRIBUTION OF RTA CASES RECEIVING FIRST-AID

First-Aid	Male (%)	Female (%)	Total (%)
Yes	43(31.2)	6(26.1)	49(30.4)
No	95(68.8)	17(73.9)	112(69.6)
Total (%)	138(100)	23(100)	161(100)

It was seen that out of 161 (100%) RTA cases the evidence of alcohol was recorded in 21 (13.0%) of the victims while 140 (87.0%) did not have it. Of the 138 (100%) male victims 21 (15.2%) showed evidence of alcohol. None of the females showed any evidence of alcohol. (Table-VI)

TABLE-VI - DISTRIBUTION OF RTA CASES AS PER EVIDENCE OF ALCOHOL

Evidence of alcohol	Male (%)	Female (%)	Total (%)
Present (%)	21(15.2)	0(0)	21(13.0)
Absent (%)	117(84.8)	23(100)	140(87.0)
Total (%)	138(100)	23(100)	161(100)

Among the total 161(100%) RTA cases 143 (88.8%) cases were able to recover and 18 (11.2%)

cases succumbed to their injuries and died. Of the 18 (100%) who expired, males constituted 17 (94.4%) and females 1 (5.6%) in number. (Table-VII)

TABLE-VII - DISTRIBUTION OF RTA CASES WHO HAVE RECOVERED OR EXPIRED

Condition of cases	Male (%)	Female (%)	Total (%)
Recovered	121(87.7)	22(95.7)	143(88.8)
Expired	17(12.3)	1(4.3)	18(11.2)
Total (%)	138(100)	23(100)	161(100)

In this study it was observed that 97 (60.2%) of the total RTA victims were pedestrians, 38 (23.6%) were those who were driving two-wheelers and 26 (16.2%) were those driving four-wheelers out of the total 161 (100%) cases.(Table-VIII)

TABLE-VIII - DISTRIBUTION OF TYPES OF VICTIMS INVOLVED IN RTA

R A victim	Male (%)	Female (%)	Total (%)
Pedestrian	80(57.9)	17(73.9)	97(60.2)
2-wheelers occ	36(26.1)	2(8.7)	38(23.6)
4-wheelers occ	22(16.0)	4(17.4)	26(16.2)
Total (%)	138(100)	23(100)	161(100)

Out of the total 161 (100%) RTA cases, 12 (7.5%) had injuries of upper limb, 42 (26.1%) had injury of lower limb, 79 (49.0%) had injury on the abdomen and 28 (17.4%) had multiple injuries at more than one site. (Table-IX)

TABLE-IX - DISTRIBUTION OF RTA CASES AS PER TYPE OF INJURIES SUSTAINED IN RTA

Part involved in RTI	Male (%)	Female (%)	Total (%)
Upper Limb	9(6.5)	3(13.0)	12(7.5)
Lower Limb	36(26.1)	6(26.1)	42(26.1)
Abdominal	70(50.7)	9(39.1)	79(49.0)
Multiple	23(16.7)	5(21.7)	28(17.4)
Total (%)	138(100)	23(100)	161(100)

The severity of injuries suffered by the victims was graded according to the “Trauma Index” [4]. According to this index injuries are classified as minor injuries (0-7), moderate (8-18) and severe injuries (more than 18). So in this study it was observed that 94 (58.4%) had a score of 0-7 and categorized under minor injuries, 49 (30.4%) had a score of 8-18 and categorized under moderate injuries and 18 (11.2%) had > 18 injuries and put under the category of severe injuries. Of the 138 (100%) male RTA victims, maximum, 79 (57.3%) had minor injuries (0-7 score) and similarly from 23 (100%) female RTA victims, maximum, 15 (65.2%) had minor injuries (0-7 score). (Table-X).

TABLE-X - DISTRIBUTION OF RTA AS PER SEVERITY OF RTI AND TRAUMA INDEX SCORE (TIS)

Severity of RTI / TIS	Male(%)	Female(%)	Total(%)
Mild (0-7)	79(57.3)	15(65.2)	94(58.4)
Moderate(8-18)	42(30.4)	7(30.4)	49(30.4)
Severe(>18)	17(12.3)	1(4.4)	18(11.2)
Total (%)	138(100)	23(100)	161(100)

DISCUSSION

In the present study the highest number of RTA victims 26% was found in the age group of 20-30 years. Similar results were reported by others also [5-9] .However in few studies 16-30 years and 15-35 years age groups were more involved in RTA [10, 11].

Another study from Delhi, reported that the people in the third decade of age were more commonly involved in RTAs [12] .The present study shows that about 67% of the victims were in the age group of 20-50 years. This shows that the people of the active and productive age group are involved in RTAs which adds a serious economic loss to the community. Similar observations were also made by others [5, 6, 13, 14]. The present study points out the fact that the age below the age of 20 years and above 60 years, there were less accidents. The reasons could be that children were taken care of by elders and less use of vehicles in the adolescent age group. Lower proportion of RTAs in the age group of 60 and above could be due to generally less mobility of the people. Similar observations were also recorded in other studies [5, 6]. The accident rates were 6 times higher in males than in females according to this study. This is in contrast to the study by Nilambar et al. [5, 6] and also by Mehta SP [7] where the accident rates were 4.9 times higher in males than in females. In a study made by Biswas et al. [9] and in another study by Ghosh [12] it was found that the male and female ratio among victims of RTA was 9:1. Thus the present study shows that males are more exposed to RTAs than females.

It was observed in the present study that maximum,(33.5%) of the RTAs occurring in the evening from 6pm-12am.This may be due to the people coming back from work are tired after working for long hours and also urgency to reach

their destination. Another reason can be attributed to the drinking of alcohol in these times. This is also supported by a similar observation made by Biswas G et al. [9] in his study of RTAs in North East Delhi. Similar observations were also made by Kochar A et al. in their study. A report in the leading newspaper, "The Hindustan Times" states that accidents occur between 8pm to 9am [16].

It was observed in the study that majority (48.5%) of RTAs was during rainy season and the least (18.0%) were in the summer season. This is because in this part of the world, rainy season forms the predominant season and rainfall is continuous and torrential. This not only decreases the visibility on the road but also makes the roads, mud paths and footpaths very slippery which is conducive for accidents. This is in contrast to the study made by Biswas G [9] who found that the majority of the RTA cases occurred during summer.

In this study it was observed that 13% out of total RTAs reported within 1 hour of accident to the hospital which stresses the importance of saving life within the golden period of first 1 hour. Majority (18%) of the cases reported to the casualty within 1-2 hours of RTA while the least (4.9%) cases reported after 2 days. For a comparison of these facts similar studies where such time was recorded were not available.

Out of the total RTA cases, only 30.4% received First-Aid and the rest, 69.6% did not receive the same.31.2% of the total number of males received First-Aid compared to 26.1% of the total females who received the same. Comparative studies on this aspect couldn't be shown because of the paucity in its availability.

Evidence of alcohol was seen only in 13% of the RTA cases which differs from the observations made by Kochar et al [15] in their study where evidence of alcohol was found in all their cases. The etiological relation between alcohol abuse and causation of vehicular crashes both fatal and non-fatal is well established [17].

88.8% of the total RTA cases recovered while 11.2% expired. RTA deaths are increasing at the rate of 18.5% on an average per year [16]. Delhi reported 1276 fatalities in 1986 which has increased to 2123 in 1998.

In this study 60.2% of the RTA casualties were pedestrians followed by drivers of two-wheelers who constituted 23.6% and the least (16.2%) were drivers of four wheelers. Similar observations were noted in the study at Delhi [9] where the pedestrians for the largest (57.3%) group of casualties. The English daily, "Hindustan Times" mentions that pedestrian victims were 55% in the year 1999 whereas they were 45% in 1991 [16]. Study by Motoo [18] in Guyana showed 83% of the victims were pedestrians.

It was found in this study that the maximum (49%) of injuries were seen in the abdomen, and the least (42%) were seen in the upper limb. The injuries involving face, neck, head etc., were put under "multiple" as they were found associated with other injuries and not individually. This is in contrast to the study by Biswas G [9] who cited that the maximum (56.4%) injuries were found on head and neck, followed by thorax (54.5%) and abdomen (44.5%). External injuries were found more than 905% cases. Other studies like Sahdev [19], Salgado [18], Colombage [20], Steenberg [21] and Motoo [18] also showed a high incidence of head injuries in their series on RTAs. These studies contradict the observations on this aspect of the study. It was observed in this study that as per the Trauma Index score, 58.4% of RTAs had a score of 0-7 (Mild), 30.4% had a score of 8-18 (Moderate) and 11.2% had a score of more than 18 (Severe).This is in contrast to the study by Jha N et al [5] who observed that 51.2% of RTA cases had a score of 0-7 followed by 48.1% RTA cases having a score of 8-18 and 0.7% having a score of more than 18.

CONCLUSION

This study showed that RTAs were more common in the younger age groups where there is a tendency to show scant attention to traffic rules and regulations and use of safety devices like helmets, seatbelts, restraints etc. The study necessitates the requirement of an ambulance stationed at a vantage point in the highway so that the injured victim can be shifted to the casualty of a hospital or a nursing home. It also warrants the awareness of First-Aid training to common people so that precious life can be saved within the golden one hour period. Any sort of substance abuse or drinking to be avoided if a person has to drive for this hampers his or her concentration and reaction time.

RECOMMENDATIONS

There is a need for road safety education which should be directed towards road users who are frequently involved and injured in RTAs, e.g. students. An integrated programme of road safety education is suggested to pre-school, primary and middle school and high-school students.

Road side random breath resting for alcohol should be done by using breath analyzers, which can be confirmed by blood concentration of level of alcohol. Strict legislation concerning traffic and issue of driving licenses and compulsory First- Aid training should be enforced among the drivers.

International Classification of Disease code in hospitals is the need of the day for creating a strong database for further studies and research thus contributing effectively to the nascent discipline of "Accidentology".

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EUTHANASIA: PERSONAL VIEW POINT

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ABSTRACT

This essay deals with the concept, controversies, need or projected need, type and various other issues pertaining to euthanasia particularly in reference to Indian culture, health structure, legal and administrative infrastructure and civility. Author is of firm belief and opinion that India must never practice euthanasia by law.

KEY WORDS : Euthanasia, Mercy Killing, Incurable Disease

When it comes to euthanasia what should we discuss? Medicine? Ethics? Or law? Probably all of these and much more issues like social, philosophical as well as political. We begin with definition. Euthanasia (mercy killing) means producing painless death of a person suffering from hopeless incurable and painful disease. [1]

Mercy Killing- what a synonym! When the net result is death, where is the mercy in it? The term is ironical surprise.

Now we try to explain this definition of euthanasia by explaining terms around which whole concept of euthanasia revolves.

INCURABLE, HOPELESS OR IRREMEDIABLE DISEASE

This term is not absolute. It cannot be. There was a time that small pox would kill not only the sufferer but would also spread to at least few others in the vicinity equally fatally. Now we talk of small pox not as a disease but only as a potential biological warfare. This statement is true for almost all infectious diseases of past which the mankind has conquered. In Indian context we can still think of tuberculosis. Say about 70 to 50 years ago the tuberculosis was considered 'the *Rajrog*' it would come, stay and take away the patient. When I was medical student the prognosis of leukaemia was about six months or so. Now such patients comfortably survive for six years or even more. I must mention one case of one of my family members. She was diagnosed and operated upon for carcinoma in left breast in 1975. Can you imagine when did she die? She died in 1997 suffering her third primary cancer in lower end of oesophagus. Her second cancer was second primary malignant tumour in her right breast in 1984. Both of these tumours (1975 and 1984) were allopathically diagnosed and treated in M.G.M. Medical College and M.Y. Hospital, Indore. Records are available for everybody to verify. Ironically the Professor and Head of surgery dept who operated upon her for first tumour died far earlier than 1997 due to cerebrovascular stroke. The modern medical science does not know everything about either the disease or the human body. Therefore the medical science does not know what shall be their interactions. In biology variation is the rule; stability is an exception.

Reasons of citing this example is that diseases were there, so were the efforts. So are the results for all to see and benefit. You will have to imagine had this law of euthanasia prevailing at that time what would have happened? Clearly all of these persons would have been mercifully killed and civility would have not benefited at all.

Remove the disease not the diseased said M.K. Gandhi.

Remove the poverty and not the poor said Indira Gandhi.

When we want to remove sick instead of sickness, we are also removing the challenges from our lives. We are accepting defeat. We are closing down the shutters for all progress and all inventions. Also we are denying the patient the possibility of mistaken diagnosis, a new cure and or spontaneous remission. [2] This cannot be a forward step.

NOW WE TALK ABOUT 'PAIN'

Deaths are painful is a wrong concept. Majority of deaths are peaceful. Even the majority of patients sufferings from cancer die peacefully.2 Even if we consider this situation that deaths are painful or some deaths in question are painful which pain are we talking about? To begin with we are talking about physical pain. Can we have an

objective parameter to gauze this pain and say if patient is suffering from this degree of pain he must die. No, we cannot. Threshold of pain is different in different persons and different on different occasions in the same person even when the cause remains the same. We cannot make such a fluid situation a basis to decide whether the person should live or die?

We will have to think further which pain is greater? Physical or psychological or social? Why does victim of rape commit suicide in India? That social stigma causes pain to her so she commits suicide. Does that mean that all victims of rape those who do not commit suicide should be terminated because they are in pain. The situation of 'painful disease' and condition of severe pain in any disease is misnomer. In modern era we have so many and so easily available means to relieve physical and even psychological pain that this argument of dreadful pain to use euthanasia becomes irrelevant.

If we make physician assisted death a law then the presumption that people who attempt suicide are deranged and in need of psychological help, borne out by many studies and years of experience, would be reversed. Cry of pain could be an expression to see if any one out there really cares for him. If society creates a right to suicide or going further ahead and authorises physician to assist him to die the message would be we don't care if you live or die."

Almost all disorders causing pain are treatable. Depression can be treated. Alcoholism can be over come. The difficult situations and circumstances of life, which, at the moment, seem permanent and pervasive, often dissolve or resolve in time. Therefore if the patient were kept alive the pain would go.

Basically in most of the cases patient is in dreadful pain because medical fraternity does not treat the pain thoroughly. The social and mental pain suffered by terminally ill patients may exacerbate the physical pain they experience. [3, 4]. Instead of trying to legalize the killing of patients in pain, the doctors should be taught to use effective pain management.

CONSENT, DESIRE, AND WISH

Too much importance is given to this word in medical and legal circles. Consent to be killed. And consent to assist to be killed. Very simple. Why majority of healthy populations does not think of death? Forget about going ahead and asking physician friend to give him a lethal injection. Why are we talking about this aspect in relation to so called terminally ill patients only? Simply because they are in 'different' situation. Does it also not mean that this 'different' situation has affected his 'compos mentis'? Can we consider whatever they say about their life and death is free, fair and frank? No. We cannot. What we can say is that the disease they are suffering has created a particular mental, familial, economical and therefore collectively social situation, which influences the mind and so the aspects of consent also. There are multiple evidences that terminally sick persons want to die not because of the pain or the disease but due to altered mental status. [2, 3]

Elisabeth Kubler-Ross outlined the five stages of the dying process- denial, anger, bargaining, depression and acceptance. After her experience of twenty years in dealing with such type of terminally ill patient she says suicide is wrong. So is to assist to die. [3]

There are many studies, which suggest that terminally ill patients may change their minds as regard to the option of assisted suicide. On one occasion they have said yes to it and on other occasion they have said no to it.[5, 6].As such this change of mind does not required any study to prove it. It is a matter of common senses; in day-to-day life time and again human being does change his mind. Similarly, it is also very clear that 'nothing happens till it happens to him.' Therefore it is probably too much to expect that whatever a man has thought about an imaginary situation few years ago in a different set of circumstances shall be the same after few or multiple years in changed circumstances. Do we not have cases of multiple wills made by a person during his lifetime? If a person can change his mind for disbursement of his property multiple times during his lifetime, can he not change it for his treatment purpose? Yes he can. In that situation, these changed circumstances nullify the whole concept of living will about assisted suicide or euthanasia in any form. Many such patients primarily decide to die one way or other because they are pressured in to seeing them selves as burdens on their family or society. Here we can take one *desi* example also.

Imagine a grand old man who is sick. He sees that his sickness is consuming not only the savings but also the borrowings. He may one good day decide to die to 'relieve' his son and grand children of this burden.

This sickness of elderly father may also make his son to think differently. He might think enough is enough. Now this person who is consuming money, time, emotions and many others of my things must die. All of us know it will not be difficult for him to 'manage' what he wants if such law existed in India. Family members who support the suicide of a terminally ill patient often unwittingly reinforce the notion that the ill family member's life has lost all meaning and value and is nothing but a burden. This situation reminds me what we do with the old and useless animals. The practice is to either shoot them or send them to slaughterhouse. Here we have a situation where an elderly useless, irrelevant, unproductive human being is equivalent to an animal. Advocates of euthanasia want to give same treatment to both. If it happens, it shall be the beginning of animalisation of human civilisation.

When 'right to die' is promoted as a socially acceptable 'option' the pressure to avail it to get rid of burdensome life shall be immense. So much so that it will not be far that right to die becomes 'duty to die'. [3, 7]

Mr. Humphrey in his new book wrote that the use of assisted suicide as one measure of cost containment. "The elderly", Humphrey said, "are putting a strain on the health care system that will only increase and cannot be sustained."[8]

This is a dangerous signal. By inference it says that elderly persons do not have the right to live but they have a duty to die. All those sitting here should take notice of it. Tomorrow onwards they are not going to be any younger. I extend this point further. In literature. [7] I read multiple types of euthanasia like-paediatric euthanasia administered to seriously sick or deformed infants. Geriatric euthanasia administered to seriously sick aged individuals. Battlefield euthanasia administered to severely wounded or handicapped individual. It brings us to' ideal society' where nobody is either elderly or sick or wounded or handicapped.

Literature also mentions that 'mercy killing' was in practice in the period of Socrates and Plato (400-300B.C.) [7] Therefore we now see what Plato has to say about the 'ideal society' in his work 'The Republic'. "It is plain that the governing classes, to whom the regulations are meant to apply, are expected to find no gratifications for sexual impulses except on the solemn occasions when there are called on to beget offspring for the state."[9] It further states that the children will be the property of the state and if the children were disabled, immature and sick they would not have the right to live. It seems that within 2300 years the circle is completing. The state may become 'ideal' by such rules and regulations if you allow me to say so but the human shall become the slave of human, ruler and the ruled.

I wonder had this battlefield euthanasia system prevailing during Rajput dynasty this world would not have seen "Rana Sangha" the warrior, the great patriotic person and humble servant of his motherland.

Now some of the doctors have started thinking about 'futile' or inappropriate treatment say for example, seriously injured person little hope of survival why to treat him. It is going to be a futile exercise [10]. There is the very real potential that bigoted doctors would apply futile-care policies in a discriminatory fashion. Indeed, a 1996 study published by the Mayo clinic found that CPR was more likely to be considered futile if the **patient was not white**. It would establish the principle that health care can be explicitly '**rationed**'- a euphemism for discrimination against people who are elderly, disabled, chronically ill, dying other wise "expensive to care for"[10]

This brings us to medicine, ethics, legislature and politics. It is sometimes asked whether *The Republic*, the work of Plato is to be regarded as a contribution to ethics or to politics. Is it subject 'righteousness' or is it the 'ideal state'? The answer is that from the point of view of Socrates and Plato there is no distinction, except one of convenience, between morals and politics. [9]

Bob Lane has also supported this view. [11] "The beginnings at first were a subtle shifting in the basic attitude of the physicians. It started with the acceptance of the attitude, basic in the euthanasia movement, that there is such a things as life not worthy to be lived. This attitude in its early stages concerned itself merely with the severely and chronically sick. Gradually; the sphere of those to

be included in this category was enlarged to encompass the socially unproductive, the ideologically unwanted, the racially unwanted and finally all non-Germans".

What Plato said in *The Republic*, Hitler practiced that in practice. So we had (a) sterilisation legislation enacted against the first handicapped followed by that against Jews, and Gypsies (Have we forgotten the compulsory family planning programme leading to forced sterilisation in seventies in notorious Sanjay Gandhi era). (b) The murder (read euthanasia) of the handicapped would be followed by the murder of the Jews and Gypsies. [12]

We have already seen the misuse of the Netherlands euthanasia legal status. A 1990 study found that 2,700 of the 129,000 deaths in the Netherlands that year were by euthanasia (including assisted suicide) that met the Royal Dutch Medical Association (RDMA) and court criteria- in other 400- all incompetent patients- no wish to die had been expressed. [13] Oregon's physician assisted suicide law also falls short of saving civility on two counts: (a) it fails to ensure that assisted suicide be offered appropriately as an option only after efforts to treat reversible conditions have been exhausted and (b) its monitoring system fails to ensure that the consequences of this change in social policy will be adequately evaluated. [14]

The BMA committee on euthanasia also admitted that it would be impossible to provide adequate safeguards in any euthanasia legislation.

Neither supporters nor opponents of euthanasia have any panaceas to offer, and neither side has the right to demand panaceas from opposite side. All we can do is our best in an imperfect world, and in my view our best is to maintain the scarceness of life, even in horrendous circumstances, as the essential bulwark to all other rights, privileges and benefits human beings (or most of them) can enjoy on earth.

Therefore if you don't want to teach your students still further types of euthanasia like-Thick euthanasia, Thin euthanasia, Black euthanasia, White euthanasia, Dwarf euthanasia, Giant euthanasia, Socialist euthanasia, Democratic euthanasia, and Swastika euthanasia etc.

Then please follow what Lord Edmund Davies has said –"killing both pain and patient may be good morals, but is far from certain it is good law."

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REFERENCE SYSTEMS DECIPHERED FOR YOU

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ABSTRACT

Bibliographic references are used to indicate the author's sources and to enable the reader to find these sources. They are a vital part of any written academic work. It is essential to cite information sources consulted in order to guard against plagiarism, avoid making unsupported statements and to support statements you make within the text of your work.

KEY WORDS: Bibliography, References, Harvard System, Vancouver System.

INTRODUCTION

There are *two* basic systems in use for the format of references [1]. These are:

1. The **Harvard System** which is used most frequently in the biological literature
2. The **Vancouver System** which is used most frequently in medical literature

A **reference list** has all the references that have actually been cited (quoted directly or indirectly) in the text. A **bibliography** also contains the references to additional works to which no direct reference has been made, but which have helped to construct the essay. For most purposes a bibliography is used which contains both the quoted references and other material that has been looked at [2,3].

THE HARVARD SYSTEM

In this format, references in the text are indicated by placing the author's name and date of publication, including page numbers if necessary, in parentheses at the appropriate point. For example, (Field, 1989:12-15). In the list of references at the end of the project, references are listed alphabetically by author, with the year of publication given immediately after the name of the author. At the same time, the titles of books, periodicals, newspapers, encyclopedias etc., *are underlined or italicised*. All journal titles must be written in full. Authors can be in upper or lower case.

In the text the author's surname and the year of publication can be given in one of the forms shown below:

- *In a recent study Dunham (1997) argued that.....*
- *A recent study (Dunham 1998) shows that...*

When an author has published more than one cited document in the same year, these are distinguished by adding lower case letters (a, b, c etc) after the year and within the parentheses e.g., *Johnson (1996a) discussed the subject...*

If there are two authors, the surnames of both should be given e.g., *Matthews and Jones (1998) have proposed that...*

If there are three authors, quote all three names the first time you cite them in the body of the essay, then abbreviate this by using *et al*. Give all three name in the reference list at the end. If there are more than three authors use *et al* in the text and the reference list. *Wilson et al (1993) conclude that...*

As references are listed in alphabetical order by authors' name, if you have cited more than one item by a specific author they should be listed chronologically (earliest first), and by letter (1996a 1998b) if more than one item has been published during a specific year.

The following are examples of references from various types of resources

1. **Journals**
   YECK, C.H., LEE, K.Y., CHEY, W.Y., MENGUY, R.(1980) Electrogastrographic study of patients with unexplained nausea, bloating and vomiting, *Gastroenterology* 79, pp.311-4.
2. **Books and Other Monographs**
   DAUSSET, J. and COLOMBANI, J. (eds.) (1973)

Histocompatibility testing 1972, Copenhagen, Munksgaard.

WEINSTEIN, L. and SWARTZ, M.N. Pathogenic properties of invading micro-organisms. In: SODEMAN, W.A. JR and SODEMAN, W.A. (Eds.) (1974) Pathologic physiology: mechanisms of disease, Philadelphia, W B Saunders, pp 457-72

3. **Conferences**
   BENGTSSON, S. and SOLHEIM, B.G. Enforcement of data protection, privacy and security in medical informatics. In: LUN K.C., et *al* (Eds.) (1992) MEDINFO 92. Proceedings of the 7th World Congress on Medical Informatics; Sep 6-10; Geneva, Switzerland. Amsterdam: North-Holland pp 1561-5.
4. **Newspaper Article**
   BLAIR, T. (1999) I was wrong: PM's U-turn on junior doctors pay and conditions. *The Times;* 15 Aug: 1-2.
5. **Multimedia Material**
   Gastrointestinal tract: Physical examination for medical students. (1995) [Video recording]. Leicester: Leicester University Audio Visual Services.
6. **Internet and Other Electronic Sources**
   PERKIN, G.D., HOCHBERG, F.H., MILLER, D.C. (1996) Atlas of Clinical Neurology [CD-ROM]. 2nd ed. Version 1.1. London, Mosby
7. **Journal article in electronic format**
   GARFINKEL, P.E. *et al.* (1996). Should amenorrhea be necessary for the diagnosis of anorexia nervosa? *British Journal of Psychiatry* [online]; 168(4), pp 500-506 Available from: URL:http://gateway.ovid.com/athens [Accessed August 17 1999]
8. **WWW Sites**
   Royal College of General Practitioners (1998). *The primary health care team*. [Online]. Available from: URL:http://www.rcgp.org.uk/informat/publicat/rcf0021.htm [Accessed August 22 1999]

THE VANCOUVER SYSTEM

The Vancouver system of referencing is commonly used in medical literature. It may also be the preferred referencing system in non-medical literature where the problem of multiple references at a single point in the text occurs frequently. In this system an Arabic number, which appears as a superior figure in the text, is allocated to each source as it is referred to for the first time. This number becomes the unique identifier of that source and if the source is referred to again the identifying number is repeated. In addition, more than one identifier can be used at a single reference point to indicate multiple sources, for example:

Information has been published on international trends in the treatment of cardiovascular disease; [1,5] while of particular interest is an Australian study on hypertension.[2]

Note that the identifiers (which refer to the works listed) are placed outside the text punctuation to avoid disruption. Note also that commas used to separate identifiers at the same reference point are also set as superior characters.

The presentation of the source citation in the Vancouver system differs from other referencing systems already described in the following respects:

- The titles of books and articles are always given minimal capitalisation.
- Journal articles are not placed within quotation marks.
- Neither book titles nor journal titles are italicised.
- Journal titles are abbreviated and abbreviations used should be those listed in the most recent issue of the Index Medicus (Medline) [4].
- All authors should be listed when there are six or fewer; when there are more than six, only the first three are listed and the expression 'et al.' is added.
- Authors' initials follow the surnames and are set without full stops or space.

The following list exemplifies the style of Vancouver citations and the points made in the previous paragraph:

- In the Vancouver system a number is assigned to each reference as it is used.
- Even if the author(s) is named, a number must still be used.
- The full reference must be listed in numerical order at the end of your essay in your bibliography.
- The original number assigned to the reference is used each time the reference is cited in the text, regardless of its position in the text.

The identifier (number) can be placed

outside the text punctuation to avoid disruption to the flow of the text or it can be placed inside the text punctuation [5,6].

Based on this system the International Committee of Medical Journal Editors has suggested uniform requirements for manuscripts submitted to biomedical literature [7]. A few sample references are as follows:

Articles in Journals

1. **Standard journal article**
   (List all authors when six or less; when seven or more, list only first three and add *et al*).
   Halpern SD, Ubel PA, Caplan AL. Solid-organ transplantation in HIV-infected patients. N Engl J Med. 2002; 347(4):284-7.
2. **Organization as author**
   Diabetes Prevention Program Research Group. Hypertension, insulin, and proinsulin in participants with impaired glucose tolerance. Hypertension. 2002; 40(5):679-86.
3. **Both personal authors and an organization as author**
   Vallancien G, Emberton M, Harving N, van Moorselaar RJ; Alf-One Study Group. Sexual dysfunction in 1274 European men suffering from lower urinary tract symptoms. J Urol. 2003; 169(6):2257-61.
4. **No author given**
   21st century heart solution may have a sting in the tail. BMJ. 2002; 325(7357):184.
5. **Article not in English**
   Ellingsen AE, Wilhelmsen I. Sykdomsangst blant medisin- og jusstudenter. Tidsskr Nor Laegeforen. 2002; 122(8):785-7.
6. **Volume with supplement**
   Geraud G, Spierings EL, Keywood C. Tolerability and safety of frovatriptan with short- and long-term use for treatment of migraine and in comparison with sumatriptan. Headache. 2002; 42 Suppl 2:93-9.
7. **Volume with part**
   Abend SM, Kulish N. The psychoanalytic method from an epistemological viewpoint. Int J Psychoanal. 2002; 83(Pt 2):491-5.
8. **No volume or issue**
   Outreach: bringing HIV-positive individuals into care. HRSA Careaction. 2002 Jun: 1-6.
9. **Pagination in roman numerals**
   Chadwick R, Schuklenk U. The politics of ethical consensus finding. Bioethics. 2002; 16(2): iii-v.

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10. **Personal author(s)**
    Murray PR, Rosenthal KS, Kobayashi GS, Pfaller MA. Medical microbiology. 4th ed. St. Louis: Mosby; 2002.
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    Gilstrap LC 3rd, Cunningham FG, VanDorsten JP, editors. Operative obstetrics. 2nd Ed. New York: McGraw-Hill; 2002.
12. **Author(s) and editor(s)**
    Breedlove GK, Schorfheide AM. Adolescent pregnancy. 2nd ed. Wieczorek RR, editor. White Plains (NY): March of Dimes Education Services; 2001.
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    Royal Adelaide Hospital; University of Adelaide, Department of Clinical Nursing. Compendium of nursing research and practice development, 1999-2000. Adelaide (Australia): Adelaide University; 2001.
14. **Chapter in a book**
    Meltzer PS, Kallioniemi A, Trent JM. Chromosome alterations in human solid tumors. In: Vogelstein B, Kinzler KW, editors. The genetic basis of human cancer. New York: McGraw-Hill; 2002. p. 93-113.
15. **Conference paper**
    Christensen S, Oppacher F. An analysis of Koza's computational effort statistic for genetic programming. In: Foster JA, Lutton E, Miller J, Ryan C, Tettamanzi AG, editors. Genetic programming. EuroGP 2002: Proceedings of the 5th European Conference on Genetic Programming; 2002 Apr 3-5; Kinsdale, Ireland. Berlin: Springer; 2002. p. 182-91.
16. **Scientific or technical report**
    Russell ML, Goth-Goldstein R, Apte MG, Fisk WJ. Method for measuring the size distribution of airborne Rhinovirus. Berkeley (CA): Lawrence Berkeley National Laboratory, Environmental Energy Technologies Division; 2002 Jan. Report No.: LBNL49574. Contract No.: DEAC0376SF00098. Sponsored by the Department of Energy.

17. Dissertation / Thesis

Borkowski MM. Infant sleep and feeding: a telephone survey of Hispanic Americans [dissertation]. Mount Pleasant (MI): Central Michigan University; 2002.

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Pagedas AC, inventor; Ancel Surgical R&D Inc., assignee. Flexible endoscopic grasping and cutting device and positioning tool assembly. United States patent US 20020103498. 2002 Aug 1.

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19. Newspaper article

Tynan T. Medical improvements lower homicide rate: study sees drop in assault rate. The Washington Post. 2002 Aug 12; Sect. A: 2 (col. 4).

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Chason KW, Sallustio S. Hospital preparedness for bioterrorism [videocassette]. Secaucus (NJ): Network for Continuing Medical Education; 2002.

2 . Legal Material

Public law:

Veterans Hearing Loss Compensation Act of 2002, Pub. L. No. 107-9, 115 Stat. 11 (May 24, 2001).

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Judgments:

State of UP v. Madan Mohan. AIR 1989 SC. Cri LJ 1989;1519

22. Map

Pratt B, Flick P, Vynne C, cartographers. Biodiversity hotspots [map]. Washington: Conservation International; 2000.

23. Dictionary and similar references

Dorland's illustrated medical dictionary. 29th ed. Philadelphia: W.B.Saunders; 2000. Filamin; p. 675.

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24. In press / forthcoming

Tian D, Araki H, Stahl E, Bergelson J, Kreitman M. Signature of balancing selection in Arabidopsis. Proc Natl Acad Sci U S A. In press 2002.

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Anderson SC, Poulsen KB. Anderson's electronic atlas of hematology [CD-ROM]. Philadelphia: Lippincott Williams & Wilkins; 2002.

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Abood S. Quality improvement initiative in nursing homes: the ANA acts in an advisory role. Am J Nurs [Internet]. 2002 Jun [cited 2002 Aug 12]; 102(6): [about 3 p.]. Available from: http://www.nursingworld.org/AJN/2002/ june/ Wawatch.htm

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29. Part of a homepage/Web site

American Medical Association [Internet]. Chicago: The Association; c1995-2002 [updated 2001 Aug 23; cited 2002 Aug 12]. AMA Office of Group Practice Liaison; [about 2 screens]. Available from: http://www.ama-assn.org/ama/pub/category/1736.html

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MeSH Browser [Internet]. Bethesda (MD): National Library of Medicine (US); 2002 - [cited 2003 Jun 10]. Meta-analysis; unique ID: D015201; [about 3 p.]. Available from: http://www.nlm.nih.gov/mesh/MBrowser.html

SECONDARY REFERENCING

In some cases you may wish to quote a piece of work that has been referred to in something you have read. This is called secondary referencing as you have not read the original piece of work. You are relying on the author you are reading to have given a fair interpretation of the contents of the original work. It is important to read the original work but this may prove difficult in some instances and it is accepted that it is not always possible. Nevertheless, if you still have to refer to it, your text

must make it clear that you have not read the original but are referring to it from a secondary source.

In your list of references at the end of your work you should only include the reference where you read about the original work. You **cannot** include details about the original study as you have not read it.

Thus: In your text, you should refer to the author whose work you have read, telling the reader that he or she cites another source, which you name. This can be done in several ways:

- *Bowling (1991) cites the work of Melzack and Torgerson (1971) who developed the McGill Pain questionnaire.* Or:
- *Melzack and Torgerson (1971, cited by Bowling 1991) developed the McGill Pain Questionnaire.* Or:
- *Bowling (1991, citing Melzack & Torgerson 1971) refers to the McGill Pain Questionnaire.*

It is important to be aware that some published works are secondary sources. These may be digests or reviews of published material which have utilized reports of studies to inform their own writing. Much of this material is very useful and brings a lot of research information together in a systematic way, but you should not think that you have read the original research if you have merely read about it in a review or digest.

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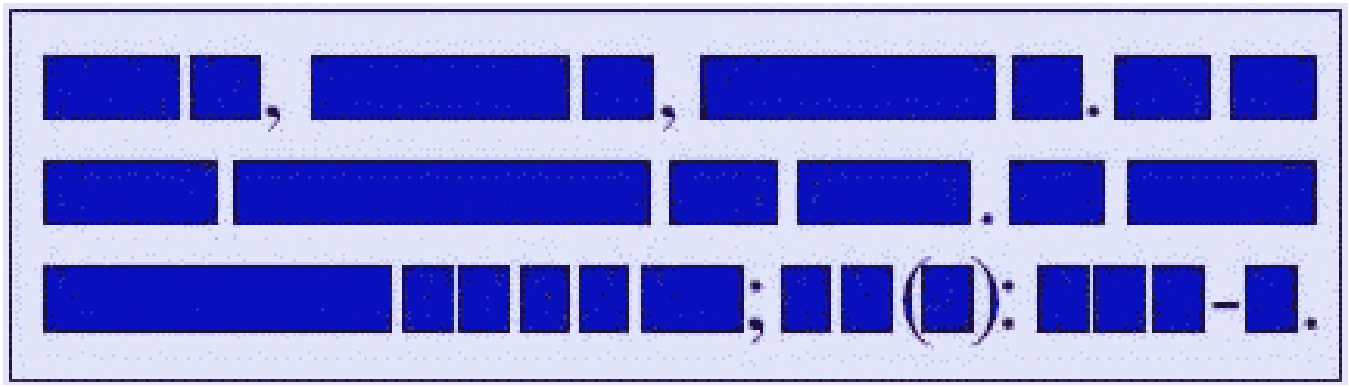

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MAGIC PILL FOR LONGEVITY

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ABSTRACT

We know that immortality is impossible but a long and healthy life is the most desired by all of us. Our cultural & religious philosophies are full of advice for human to have a longer and healthier life but these methods are difficult to adopt and perform for human beings with the present life style. Scientific people are working towards the control of aging. Development may come in terms of a pill, which will give human a long and healthier life. In this article a scientific commentary about the latest developments in reaching to such a magic pill is presented.

KEYWORDS: Longevity, Life, Caloric Restriction, Mimetic, Magic Pill

INTRODUCTION

Life on planet Earth from birth to death is a beautiful and inevitable natural cycle. People never want to leave this mystic and beautiful world so easily. Even if immortality is impossible at least long life is the most desired by every human being to live a long and healthy life. And be able to enjoy this beautiful creation of God i.e., Life on Earth for more time. Though our cultural & religious philosophies are full of advice for human to live a longer and healthier life. But these methods are difficult to adopt and perform for human beings with the present life style to achieve the desired results. Therefore, science is not behind in exploring the suitable methods to achieve a longer life and thus be able to stop aging. Aging is the buildup of molecular and cellular damage that increases vulnerability to infirmity. Researchers do agree that no treatment in the market today has been helpful to slow human aging. But consumption of a low-calorie yet nutritionally balanced diet, works incredibly well in a broad range of animals, increasing longevity and prolonging good health. The findings suggest that caloric restriction (CR) could delay aging in humans, too. Thus, for maximum benefit, people would probably have to reduce their caloric intake by roughly 30 percent, equivalent to dropping from 2,500 calories a day to 1,750. But very few mortals could stick to that harsh a regimen, especially for years on end. But what if someone could create a “magic pill” that mimicked the physiological effects of eating less without actually forcing people to go hungry? Could such a caloric-restriction mimetic, as it is called, enable people to stay healthy longer, postponing age-related disorders (such as diabetes, atherosclerosis, heart disease and cancer) until very late in life?

HISTORY OF SCIENTIFIC DEVELOPMENTS

The above question was first posed by scientists working in this area in the mid- 1990s, after they came upon a chemical agent that, in rodents, seemed to reproduce many of caloric restriction’s benefits. Since then, scientists have been searching for a compound that would safely achieve the same feat in people. They have not succeeded yet, research results have been informative and have fanned hope that caloric-restriction (CR), mimetics can indeed be developed eventually. The hunt for CR mimetics grew out of desire to better understand caloric restriction’s many effects on the body. Scientists first recognized the value of the practice more than 60 years ago, when they found that rats fed a low-calorie diet lived longer on average than free-feeding rats and had a reduced incidence of conditions that become increasingly common in old age. What is more, some of the treated animals survived longer than the oldest-living animals in the control group, which means that the maximum life span (the oldest attainable age), not merely the average life span, increased. The rat findings have been replicated many times and extended to various other creatures. Until fairly recently, the studies were limited to short-lived creatures genetically distant from humans. But long-term projects under way in two species more closely related to humans—rhesus and squirrel monkeys—suggest that primates respond to caloric restriction almost

identically to rodents, which makes scientists more optimistic than ever that CR mimetics could help people. The animals also look better on indicators of risk for age-related diseases. Efforts were made to know how the many physiological and biochemical changes induced by caloric restriction led to delaying aging in mammals. For a number of reasons, it was suspected that changes in cellular metabolism would be a key. Metabolism means the uptake of nutrients from the blood and their conversion to energy usable for cellular activities. Metabolism becomes important because the benefits of caloric restriction clearly depend on reducing the overall amount of fuel coming into the body for processing. Glucose, which forms when the body digests carbohydrates, is the primary source of energy in the body—that is, it is the main material used by cells for making ATP, or adenosine triphosphate, the molecule that directly powers most cellular activities. Therefore, alterations in the secretion and activity of insulin, which influences glucose use by cells, would be important. Insulin is secreted as glucose levels in the blood rise after a meal, and it serves as the key that opens cell "doors" to the sugar. Reductions in glucose and insulin levels and increases in cellular sensitivity to insulin are among the most consistent hallmarks of caloric restriction in both rodents and primates. As the hypothesis that caloric restriction retards aging by altering metabolism was put forward other studies were data showing that metabolic processes involving glucose and insulin influence life span. A number of investigations achieved remarkable extensions of life span in nematode worms by mutating genes similar to those involved in molecular responses to insulin in mammals.

PRESENT STATUS

Various studies mentioned a compound called 2-deoxy-D-glucose (2DG) that was being tested in rodents for treating cancer but that also reportedly lowered insulin levels in the blood. The compound apparently reproduced many classic responses to caloric restriction—among them reduced tumor growth (a response only slightly less robust than the well-known extension of life span), lowered temperature, elevated levels of glucocorticoid hormones and reduced numbers of reproductive cycles. If 2DG really could mimic many aspects of caloric restriction in animals, perhaps it would do the same for people. The compound structurally resembles glucose, so it enters cells readily. It is also altered by an enzyme that usually acts on glucose itself. But the enzyme that completes the next of several steps involved in glucose processing essentially chokes on the intermediate produced from 2DG. When it tries to act on this intermediate, it fails; in addition, its ability to act on the normal glucose intermediate becomes impaired. The net result is that cells make smaller amounts of glucose's by-products, just as occurs when caloric restriction limits the amount of glucose going into cells. Certain of these products serve as the raw material for the ATP-making machinery, which is composed of a series of protein complexes located in intracellular compartments called mitochondria. Deprived of this raw material, the machinery makes less ATP. In essence, 2DG tricks the cell into a metabolic state similar to that seen during caloric restriction, even though the body is taking in normal amounts of food. As long as the amount of ATP made meets the minimum requirements of cells, this diminished operation of the ATP-making machinery is apparently beneficial. A long-standing theory of aging blames the production of molecules called free radicals. The lion's share of free radicals in the body is emitted as the ATP-making machinery operates. Over time these highly reactive molecules are thought to cause permanent damage to various parts of cells, including the protein complexes responsible for generating ATP. Perhaps by reducing the rate of ATP production, 2DG and caloric restriction slow the rate at which free radicals form and disrupt cells. At this writing, scientists are in the midst of conducting long-term rodent trials of 2DG. Results from the first year of this endeavor have confirmed previous research findings that 2DG slightly reduces blood glucose and body temperature. Examinations are on to find whether 2DG reduces the incidence of cancer and increases life span when fed to animals at low doses from the time they are weaned until they die. The work so far clearly provides a "proof of concept" that inhibiting glucose metabolism can re-create many effects of caloric restriction. Regrettably, however, 2DG has a fatal flaw preventing it from being the "magic pill". Though safe at certain low levels, it apparently becomes toxic for some animals when the amount delivered is raised just a bit or given over long

periods. The narrowness of the safety zone separating helpful and toxic doses would bar it from human use. However, it is hoped that this is not a general feature of CR mimetics. Long-term studies confirm that inhibiting metabolism can retard aging. The task becomes finding other substances that yield 2DG's benefits but are safer over a broader range of doses and delivery schedules. Several candidates seem promising in early studies, including iodoacetate. In animals this agent appears to protect brain cells from assaults by toxic substances, just as 2DG and caloric restriction do. Treatment with antidiabetic medications that enhance cellular sensitivity to insulin might be helpful as well, as long as the amounts given do not cause blood glucose levels to fall too low.

CONCLUSION

The aim is to develop compounds that fool cells into activating maintenance and repair activities that lead to greater health and longevity of the organism. The job is difficult but no longer seems impossible. If scientists can develop agents that offer the benefits of 2DG without its drawbacks, they will finally enable people to have a longer and healthier life.

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DEAD CAN TELL TALES- A REPORT OF TWO EXHUMED BODIES

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ABSTRACT:
At times some skeletal remains may be recovered from an open land, ditches, rubbish dumps, etc., or a skeleton may be exhumed from a home-courtyard, a burial ground, or even ordinary places during excavation for new constructions. It has been documented that examination of skeletal remains under such circumstances, by a forensic expert, may help to reveal a crime, which might have lost sight of otherwise. The presented case reports are an attempt to analyze the extent to which an old saying that "dead can speak and speak the truth; we only need a patient and discerning mind to 'hear' and understand what they speak" is valid.
KEY WORDS : Identification, Bones, Exhumation, Skeleton

INTRODUCTION:

Forensic investigations are primarily concerned with personal identification; matching features of a cadaver or skeletal remains with the known characteristics of a missing person or a suspected criminal in order to establish individuality or to approach it as closely as the present day science allows. There are three levels of identification:

a) Positive identification, where there can be no reasonable doubt as to the specific person represented;

b) Presumptive identification, where details suggest possible or probable identification, but without complete certainty; and

c) Preclusive identification, when comparison of details indicates that identity is unlikely or impossible [1].

The old saying that "dead cannot speak" is incorrect. They do speak and speak the truth; we only need a patient and discerning mind to 'hear' and understand what they speak. It has been proved innumerable times that reliable information, based on scientific facts, can be derived from the dead; but only if we know "when, where, what & how" to look for the facts.

In all medico-legal cases, the investigation of a deceased body involves two major methods of approach. One is the examination of the body details of a cadaver or skeletal remains in comparison with the ante-mortem details of the suspected victim. Formal records like dental charts, x-rays, medical records, passports and photographs, etc, along with personal effects like family photographs, personal belongings and news paper clippings are some of the important means of comparative identification. The second method is used when no formal records are available. Here a systematic and thorough scrutiny of the body might reveal the sex, age, stature, personal habits or any previous medical history. Although specific information regarding a definite identification might not be possible, the data so collected might be of great aid in narrowing the possibilities of identification and in emphasizing the most likely potential victims.

The identification of human skeletal remains is a critical matter. A fully qualified specialist in this area must be extremely well grounded in comparative osteology, human osteology, craniometry and osteometry and racial morphology. Moreover he must have had extensive experience in the study of large series of human skeletal materials [2]. To identify a single lot of bones or an individual skeleton one must be able to fit it accurately into a tremendous jigsaw puzzle within the total range of variation [3]. Since ages the criminals in their attempts to conceal the crime have devised different ways out, may it be Parkman murder or Ruxton murder or the Acid Bath Cases [4], but in the end they had all failed to achieve their goals.

The present case reports based on the postmortem examinations conducted on the

skeletal remains of two dead bodies at the department of Forensic Medicine and Toxicology, Govt. Medical College Hospital, Chandigarh highlights both the above methods of approach. The first case was exhumed 11 months after internment. The accused had, after killing the victim, some how convinced the victim's family that he had died after being bitten by a snake. This, in turn proved his nemesis, as the deceased's kin buried him instead of cremating his body (an age-old belief among North Indians that people dying of snake bite should not be cremated). The relatives of the deceased easily identified the site of burial, the plastic sheet in which the body was wrapped and the dead body. The second case was exhumed 2 months after burial. It was a partially skeletonised, decomposed body of a middle-aged male. The site was identified by the accused but the body was identified by the relatives on basis of the clothes / belongings only.

OBSERVATIONS:

Case-1:

A sealed packet submitted by the investigating agency, containing human skeletal remains recovered on exhumation 11 months after burial. Total number of bones recovered: 168.

Skull with mandible: Both showed features of male sex; 3rd molar was erupted. Basilar suture was fused. The mandible was broken into 3 pieces. A Depressed Signature Fracture measuring 3.5cm x 2.5cm x 0.5cm was present on top of the skull in the right parietal bone, 2cms above the right parietal eminence.

Photograph No.1: Shattered pieces of skull bones with irregular margins between outer and inner tables.

Photograph No.2: Separation of temporo-parietal and parieto-occipital sutures in continuation to the fracture Ala Signature.

From the upper angle of the depression, a fissure fracture was extending to join the saggital suture at the vertex, followed by sutural separation of the saggital up to the Bregma and then to the left limb of the lambdoid suture. Separation of the left temporo-parietal suture was also present.

The right supra-orbital region was missing, with irregular margins and irregular separation the outer and inner tables. The left supra-orbital region showed a depression in an area of 3.5cm x 2cm, with some fragments of the bone missing.

Upper limb bones: 2 shoulder blades, 2 collar bones, 2 humeri - the right measuring 34.3cms and the left 34.4cms; 2 ulnae and 34 small bones. Medial end of the clavicle was fused, as were the epiphyses of the long bones. Lower limb bones: 2 hip bones, each showing features of male sex, 2 femurs -the right measuring 47.6cms and the left 48.4cms; 2 tibiae, 2 fibulae and 33 small bones. Ischial tuberosity was fused, as also all the segments, except the 1st, of the sacrum.

The examination of the Skeletal Remains revealed that the exhumed body belonged to a male, aged about 25 years, whose stature was

approximately 170cms. The depressed fracture of the skull pointed towards the cause of death.

Case-2:

A decomposing, partially skeletonised human body, exhumed after about two months of burial. External examination revealed:

1. Depressed comminuted fracture of the right fronto-parietal region of the skull.
2. Depressed comminuted fracture of the left parieto-occipital region of the skull.

After the external and internal examination, the bones were separated from the decomposing soft tissue by the 'Anti-formin' technique [5].

Examination of the skeletal remains revealed that the exhumed body belonged to a male, aged about 40 years and whose stature was approximately 181cms. The skull was found shattered into 38 pieces of various sizes with irregular margins between outer and inner tables.

Photograph No.3: Depressed Signature Fracture on top of the skull in the right parietal bone.

The fractured pieces were assembled and based on the observations made prior to and after the separation of bones from the soft tissue, cause of death was arrived at.

For the purposes of stature estimation, lengths of the long bones were measured using a Hepburn type osteometric board and multiplication factors suggested by Siddiqui and Shah [6]. Age estimation was based on parameters enunciated by Hepworth [7]. Reconstruction of the skull was got done to establish the identity by the Superimposition Technique [8,9,10] to remove any doubts regarding the identification initially based on clothes only.

DISCUSSION:

Identification means determination or establishing the individuality of a person. Truly speaking, identification of an unknown person or a dead body is the duty of the police. However, the Forensic expert guides the investigating officer using his expertise in defining important physical and morphological features of the person or the dead body with which the investigating officer is not acquainted but which are of great significance in establishing the identity. The medico-legal expert or specialist in Forensic Medicine is not a detective. One of his important functions is to furnish the investigating agencies with specific information on matters of which he has specialized knowledge. He sees the case as a whole; he observes, infers and even speculates. To him, because of his special knowledge, a non-medical clue may have a significance that even an astute policeman may not be able to grasp. His peculiar experience and talents may enable him alone to deduce the correct interpretation of the facts [11].

A dead body is evidence, evidence to be photographed, X-rayed, described, analyzed in depth and correlated with circumstances. The objective is to search thoroughly for crucial information that enables one to judge what did happen and did not happen to the decedent [12]. A forensic expert, with his specialized knowledge, would be able to deduce - who was the person, what happened, and what evidence indicates the presence or the absence of culpability? This is essential to establish the *Corpus Delecti*, which in cases of homicide consists of three parts-a) the identity of the victim, b) determination that death was not natural, and c) the death resulted from the criminal act of another person.

Identifying murder victims usually involves anthropological and facial reconstruction techniques [13]. Odontostomatological techniques have been shown to be particularly useful in solving

the problem of identifying a subject even after serious destructions [14]; the accurate identification of human tissues may be difficult when specimens are small, fragmented or burnt. A wide variety of materials may be submitted as human-including parts of animals or non-organic materials [15].

A careful and thorough examination of bones may yield a wealth of information, which if properly interpreted, may tell a lot about the individual during his life. But, usually the cause of death may not be easily ascertainable. The cases reported here, however, point towards a definite cause of death-Blunt force impact to head leading to Cranio-cerebral Damage. This is particularly true of the 1st case, where the depressed signature fracture on the right parietal bone, even 11 months after internment, gave the following information:

1. That the weapon of assault (probably a hammer like object) had an oval striking face of about 3.5 x 2.5cms.
2. That the assailant was to the left of the victim at the time of assault and
3. That he was positioned relatively higher than the victim i.e. the victim was either kneeling / crouching / or sitting, etc, while the assailant was standing.

The dimension of the depression on the left supra-orbital region was the almost same as that on the right parietal area, implying thereby that the victim was struck twice with the same weapon.

In the second case, however, such detailed intonation was missing except for the fact that two depressed fractures were noted on the skull, before the body was subjected to 'Anti-formin' technique. The fact that the skull was recovered in 38 different pieces with irregular margins and irregular separation of the outer and inner tables, however, tells its own story of Blunt force impact to the head being the cause of death.

CONCLUSION:

Validity of the old saying that "dead can speak and speak the truth; we only need a patient and discerning mind to 'hear' and understand what they speak" being proved with certainty in one case but only partially in the other validates yet another old saying that "all possibilities can not be ruled out beyond reasonable doubt".

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ETHYLENE GLYCOL POISONING A CASE REPORT

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ABSTRACT

An Airman of Indian Air Force was admitted to the hospital with the history of poisoning of unknown substance. Despite of all supportive and symptomatic treatment the patient died after three days. The gastric lavage was done on admission. The postmortem was conducted and cause of death was ascertained as poisoning, as suggestive with the finding.

The viscera and the gastric lavage were analyzed along with the bottle recovered from the scene of incidence labeled as "ANTIFREEZE". All the samples were found positive for Ethylene Glycol. The interesting facts are discussed in detail.

KEY WORDS : Ethylene Glycol, Poisoning, Antifreeze.

INTRODUCTION

Ethylene Glycol chemically occupies a position between ethyl alcohol and glycerol. It is a colorless, odorless, clear, nonvolatile, bittersweet but pleasant taste. Its minimum lethal dose is 100 ml for a 150-pond man. It is miscible with water and ethanol. It is reported to be taken accidentally in lieu of alcohol or also as a substitute of alcohol. Fatalities have been reported in many cases. On ingestion, it chiefly causes cerebral damage. Fatal period is 3 days. Half life is 3-5 hours. Antidote is pure ethyl alcohol, as ethylene glycol is metabolized by alcohol dehydrogenase enzyme in absence of ethyl alcohol and metabolizes to glyceraldehydes and subsequently to lactic acid and oxalic acid, calcium oxalate crystals are deposited in the kidney. Thus ethylene glycol itself is probably non-toxic; its toxic effects are due to its metabolites.

Ethylene glycol is used as antifreeze, coolant, industrial solvent and in electrolytic condensers.

TREATMENT

Gastric lavage, enemas, administration of Alkalis and fluids, sodium bicarbonate (i.v.) for acidosis, short acting barbiturates for convulsions, oxygen, artificial respiration, maintain body heat, fluid and electrolyte balance.

Treat for kidney damage - Haemodialysis. Block the metabolism of ethylene glycol by administering ethanol, which has a high affinity for alcohol dehydrogenase (100 times more than that of ethylene glycol). A serum ethanol level of 100 mg/dl is essential to achieve this object. The dose is the same as that for methanol poisoning i.e. 1g per kg of 20-30 percent alcohol and maintenance dose is 130 mg/kg per hour.

CASE HISTORY

The deceased was 22 years old male. He was found unconscious in his room and shifted to the hospital with primary sign and symptoms of alcoholic intoxication, increased pulse and respiratory rate absence of reflexes. Symptomatic and supportive treatment was given after 2 days he developed acute nephritis, bronchopneumonia and hypertension and passed away after three days.

This revealed that the cause of death is not only the alcohol but there must be some other agent ignorantly or intentionally taken with the alcohol. Because alcohol does not give such type of sign and symptoms.

As it is known that it is a common hazard of drunker to take poison by mistaking it for alcohol. In the condition the person died, it may be denatured spirit or any other similar liquid, which might have taken by the deceased in effect of alcohol.

Looking back to the history of the deceased it was known that the deceased was transferred few days back from Leh to Bhopal. Leh is a cold place, where defence personals use antifreeze to protect them from cold, as it does not get absorbed at all through the skin. Inhalation also does not

result in clinical toxicity because of its low vapour pressure. Therefore ingestion is the main route of toxicity.

Basing on these lines the investigation was started.

POSTMORTEM FINDINGS

The autopsy was conducted and cause of death was ascertained as poisoning with the postmortem findings as lungs congested, edematous, frothy blood exude out, trachea full of blood tinged froth, stomach, duodenum and ileum wall were inflamed, mucosa hemorrhagic all over, emitting sweetish smell.

MATERIAL AND METHOD

The stomach and its contents, and pieces of body tissues like liver, lung, heart, kidney and brain were sent to the toxicology laboratory for chemical analysis to determine the poison responsible for death.

The analysis was carried out starting with color test followed by micro-diffusion and Spectrophotometric studies. The results were confirmed on HPLC.

RESULT AND DISCUSSION

Preliminary test determined the presence of ethanol but the concentration was not high neither explicable as the case was three days hospitalized. When exhaustive efforts were made to find the poison and it was determined as ethylene glycol, which was also found positive in viscera and gastric lavage. The concentration was calculated to be 10 mg% in viscera and 25mg% in gastric lavage. Studies conducted earlier have reported blood concentration of ethylene glycol as 80mg per ml after 36 hours of ingestion of 150 ml ethylene glycol. Likewise 300ml, 500mg/ml after 18 hour, 500 ml, 600mg/ml after 24 hours (Walton 1978)

The room of the deceased was searched after this finding and a bottle was recovered labeled as antifreeze, which was also analyzed and confirmed as ethylene glycol.

It indicates that the deceased might have taken this antifreeze agent in place of alcohol, as it does not differ much in the taste with alcohol, and this must have been taken after initial intake of alcohol to the level of intoxication either accidentally or intentionally. After further investigation it was revealed to be an intentional act.

CONCLUSION

It is a case of hazard associated with the alcohol. In such condition when a patient is admitted with the history of alcohol intake, it is always safer to analyses the blood at least for methyl alcohol and ethylene glycol to avoid any later emergency. This may prove to a life saving effort.

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SITUS INVERSUS TOTALIS

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ABSTRACT

Situs inversus is a condition in which organs of chest and abdomen are arranged in a perfect mirror image reversal of normal positioning. Situs solitus is normal position of human organ.

KEY WORDS : Situs Inversus Totalis, Kartagener's Syndrome, Congenital Anomaly.

Situs inverses has an incidence of 1:4000 in Japan, 1:5000 in Israel and 1: 10,000 to 15,000 in United States and Northern Europe. [1]

Situs inversus was recognized by Fabricus in 1600 when he described a case of reverse liver and spleen. Petrius Servius in 1615 described total transposition of viscera. Another similar observation was made by Riolan [1] in a case of executed criminal and in the Queen of France; Marie de Medeci [1] was still another authenticated case (Beck). Kuchenmeister in 1824 [1] recognized Situs inversus in living person for first time. Lewold demonstrated the difficulty in obtaining valid static for Situs inversus. Lewold [1] reports that on physical examination the reported frequency is 1/ 35000, from dissecting room 1/10000, from post mortem examination, 1/5000 and from x-ray examination 1/1400. Situs inversus has been associated developmentally. With non motile cilia [2] and is transmitted as an autosomal recessive trait (Kartagener's syndrome). Immobile cilia resulting in sterility and chronic bronchitis may accompany Situs inversus [3].

CAUSE

Early in normal development of an embryo, the tube like structure that become the heart forms a loop towards the left, identifying the left/right axis along which other organs should be positioned. Although exact mechanism for this positioning is not known. But it has been correlated with gene and many other factors. Situs inversus can be seen in families.

CASE REPORT

On 26.2.04 dead body of unknown male was brought for autopsy in the mortuary complex of Govt. Medical College, Amritsar.

It was dead body of elderly male with gray hairs, clothes were torn and soiled. Length of body was 5 feet; rigor mortis was present in short muscles of fingers and toes. Early putrefactive changes were present in the form of distension and discoloration of abdomen and skin slippage was present at places. He had following injuries:

1. Reddish brown abrasion in right part of chest and right flanks in an area of 17 x 10 cm.
2. Post mortem ant bites in left side and back. Tattoo mark, DR present on flexor aspect of right forearm and its middle.

Fig. 1

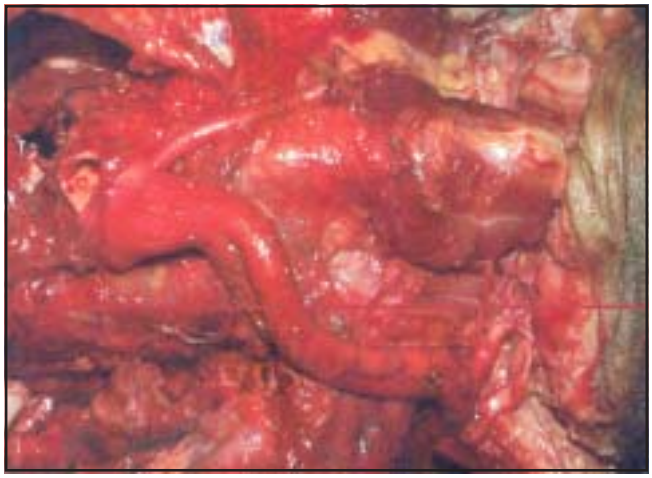

Fig. 2

Fig. 3

O/D of body

Chest Cavity: It showed dextrocardia (Fig. 1) and dextro positioning of great vessels. Right lung (weight 230 gm) had two lobes. Left lung had three lobes (weight 262 gm) (Fig. 1). Thoracic aorta descended from right side to the abdomen (Fig. 2). Inferior vena cava was present on left chest cavity. Azygos vein was present in left chest cavity draining in sub clavian vein instead of SVC on right side. Right common carotid did not branch into internal carotid artery but continued as external carotid artery; left common carotid was arising from brachiocephalic trunk which bifurcated to external and internal carotid artery.

Abdomen: Oesophagus entered abdominal cavity through right crus of diaphragm and stomach was completely inverted in right subphrenic space. Liver with gall bladder was inverted in left subphrenic space (Fig. 3). Loop of duodenum was reverse 'C' having head of pancreas on left side of abdomen and tail on right side. Spleen was also seen on right side of abdomen. Caecum with appendix was located in the left iliac fossa. Sigmoid and pelvic colon was descending down from right flank to join rectum. Kidneys were small in size. Right was lower than the left kidney. Right testicular vein was directly opening in right renal vein. Right testis was of small size.

Cranial cavity: Meninges were inflamed and fibrinous adhesions were present between pia and arachnoid matter. CSF was in large volume and turbid in character. Sulci and gyri of the brain were flattened.

Anomaly of right internal carotid artery was observed. It was arising from the left internal carotid artery passing towards the right side at the level of cavernous sinus through sella turcica entering the base of brain to divide into the middle and anterior cerebral artery which in turn formed the circle of Willis. All the cranial sutures were fused. Approximate age was 65±5 years. Cause of death was natural disease i.e. comatoasphyxia as a result of meningitis.

SUMMARY AND CONCLUSIONS

It was rare case of Situs inversus totalis with congenital anomaly of right internal carotid artery. Since the inception of Department of Forensic Medicine 14864 autopsies have been performed from 10.2.1985 to 26.2.2004. This is a first case of Situs inversus totalis revealed on autopsy.

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CEREBRAL AMOEBIC ABSCESS - AN AUTOPSY CASE REPORT

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ABSTRACT

Sometimes the pathologists come across some rare diagnoses. Amoebiasis usually involves intestines; extra-intestinal lesions are mostly in liver or some times in lungs. Brain is amongst the very rare sites of amoebic abscess. A case of a prisoner who died in hospital after an illness, diagnosed as amoebic cerebral abscess is being presented.

KEY WORDS: Amoebic, Cerebral abscess, Entamoeba histolytica.

INTRODUCTION

Cerebral amoebiasis is uncommon but not a rare entity. It is hematogenous in origin but usually arises from, or is concomitant with amoebiasis of liver or lung [1,2,3]. It is three times more common in males than in females.

Trophozoites of *Entamoeba histolytica* reach CNS via

1. The vertebral venous plexus or
2. Rarely via lungs.

Abscess is generally found in one of the cerebral hemispheres; may be single or multiple. Free living amoebae especially *Naegleria fowleri* and *Acanthamoeba* can cause primary amoebic meningoencephalitis (PAM) which is rapidly fatal necrotizing encephalitis and granulomatous amoebic encephalitis (GAE) respectively. The case is being presented for rarity of this lesion.

CASE REPORT

A 60 year male prisoner lodged in Central Jail Patiala died in jail hospital after remaining in coma for two days, earlier he complained of head ache for some days. Autopsy specimen of brain was received in the Department of Pathology Govt. Medical College Patiala, as the meninges and the brain were congested; and there was a purulent fluid in the meningeal spaces.

Gross Examination

Brain along with meninges was weighing 1200 gm. There was congestion of blood vessels of meninges and brain especially in the parietal region of brain. Cut surface showed brownish necrotic areas measuring 4.5 X 4.0 cm (Figure1).

Microscopically

In the center of the abscess, there was seen necrotic tissue debris. In the abscess wall, congested and dilated blood vessels, polymorphonuclear leucocytes, lymphocytes, macrophages and trophozoites were seen.

The trophozoites were large having abundant vacuolated cytoplasm and small nucleus

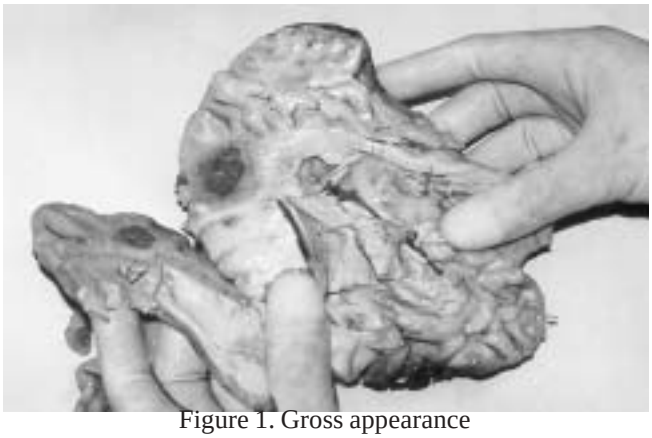

Figure 1. Gross appearance

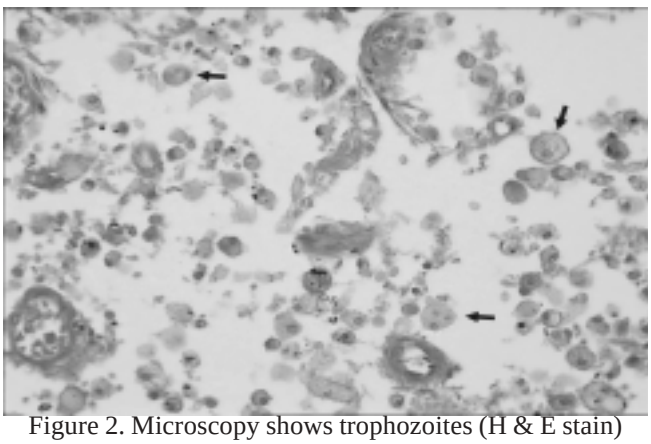

Figure 2. Microscopy shows trophozoites (H & E stain)

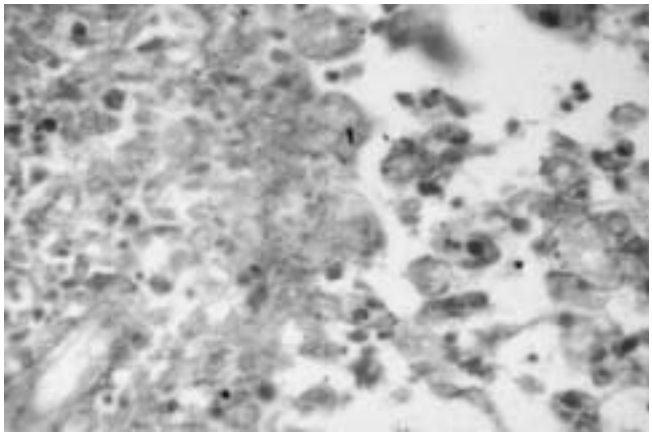

Figure 3. Microscopy - PAS stain

with karyosome. In some of them, ingested RBCs were seen (Figure2 & 3). PAS stain confirmed the presence of trophozoites.

DISCUSSION

Amebic brain abscess is invariably fulminating with clinical evidence of destructive brain lesion, usually in cerebral hemispheres, with fatal termination in 7 to 10 days, and not specifically diagnosed until necropsy [1] (Craig and Faust's Clinical Parasitology, 1974). It may reach brain via hematogenous route (Figure 4).

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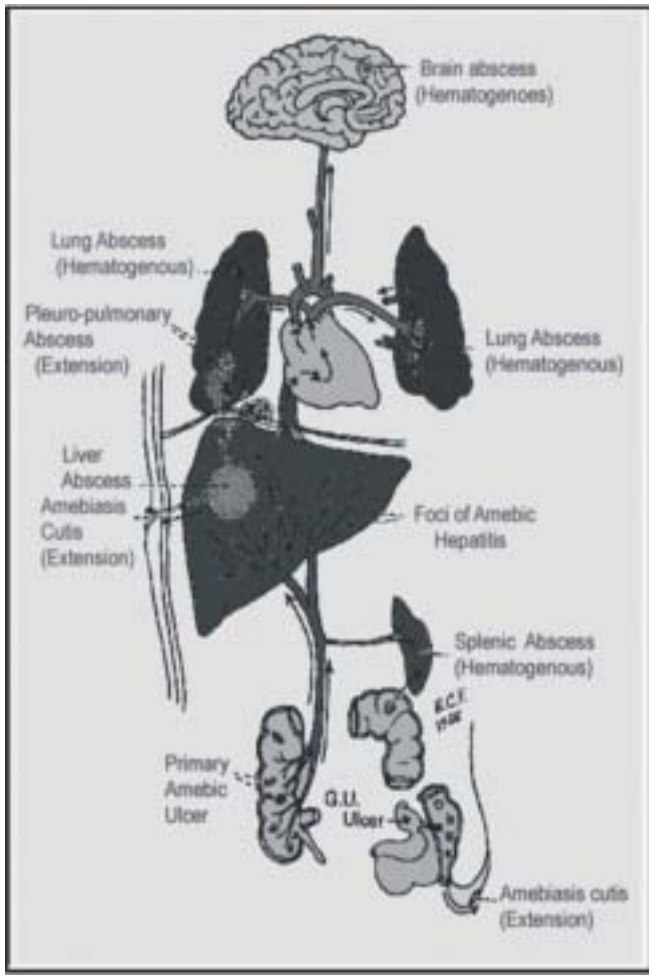

Figure 4. Metastatic amoebic abscess

This case was presented in XXV Congress of International Academy of Pathology, Brisbane Queensland-Australia, Oct.10–15, 2004.

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FIREARM INJURY - MURDER OR SUICIDE

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ABSTRACT

A case of fire arm injury was referred to this Institute where the deceased was having entry wound of bullet at right side of head, but the right hand was found behind the back of the deceased lying in supine condition on his bed. The service pistol was found on his chest.

The deceased was a police sub-inspector and was on probation period. The case was preliminary suspected to be murder but on analysis of the case on various angles as well as the laboratory analysis the case was revealed as suicide. The detailed analysis of the case has been discussed in this paper.

KEY WORDS : Firearm, Murder, Suicide.

CASE HISTORY

The deceased was 28 years old trainee assistant sub-inspector of the police was residing in the police mess. He was found dead in his room lying on his bed. The blood was found on the bed. The service pistol was found on the chest with the butt on the left side. Left hand was hanging in the left side of bed on the ground. The entry wound was located at right side of the temporal region. Right hand was pressed under the back; the left hand was having blackening effect. The exit wound was on left side of temporal region oblique to the entry wound. The margins were everted. The bullet mark was found near the window corresponding to the site of exit wound.

POSTMORTEM FINDINGS

Gunshot injury wound of entry over the right temporal region 4cm forward to upper border of right ear with singeing of hair, circular wound 1.5x2.5cm with inverted margin with blackening of skin, tattooing of skin. Wound communicating with cranial cavity.

Wound of exit is on left temporal region 8cm upward and forward to upper border of ear, margins everted, blood stain discharge with bubble coming from wound size 2.5x2.5cm communicating to cranial cavity. Wound is ante-mortem in nature.

On cutting laceration of tissue beneath wound of entry with circular wound over temporal bone corresponding to wound of entry. Other wound is present on left temporal bone with laceration of tissue and crack fracture of left temporal bone apart from wound of exit.

Cause of death – injury to brain
Mode of death – Coma
Time since death – 24 hours
Skin, soft tissue, hair preserved
Washing of both the hands preserved.

ANALYSIS

The chemical analysis of the washings of both the hands was carried out in the laboratory of the Institute. The washings of left hand was found positive for chlorate and nitrate, while washing of right hand was negative for these two.

RECONSTRUCTION OF CRIME

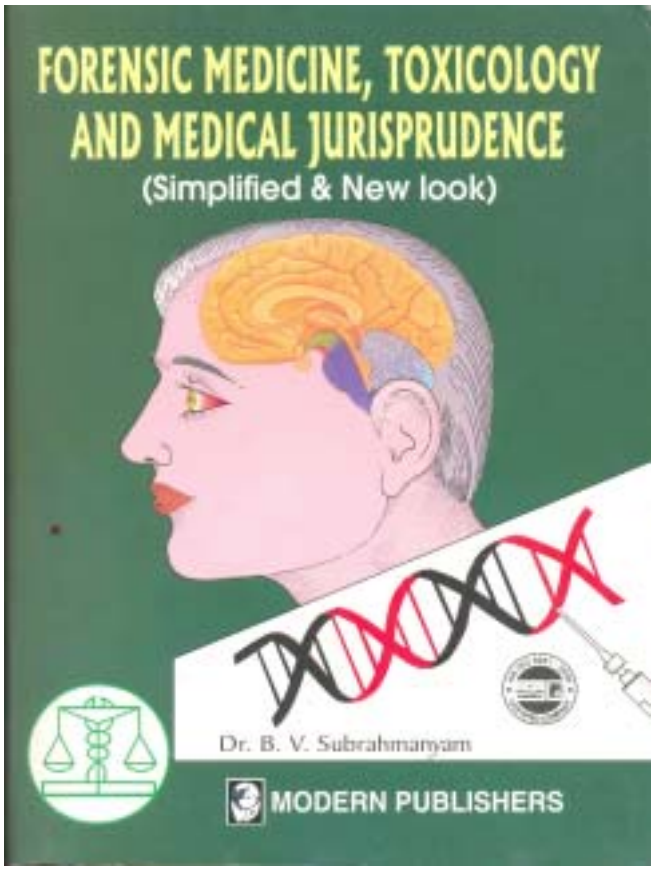
The deceased was 28 years old police sub-inspector found dead in his room with the wound of fire arm on the head. Service revolver belonging to his custody was also found placed on the neck. The doors were locked from inside.

The right hand is placed underneath the buttock while left arm is adjusted out the revolver placed on the upper chest and neck region where butt is facing towards right hand and barrel towards left side. The entry wound was on the right temporal region and exit on the left side. The bullet made a dent near the window on the wall situated nearly on the back of the head side of deceased; the bullet was lying on the floor. Hair from the border of entry wound showing singing effect. The left hand wash of the deceased was also found positive for chlorate and nitrate.

CONCLUSION

Considering all the facts it is concluded that it is a case of self firing by deceased by left hand.

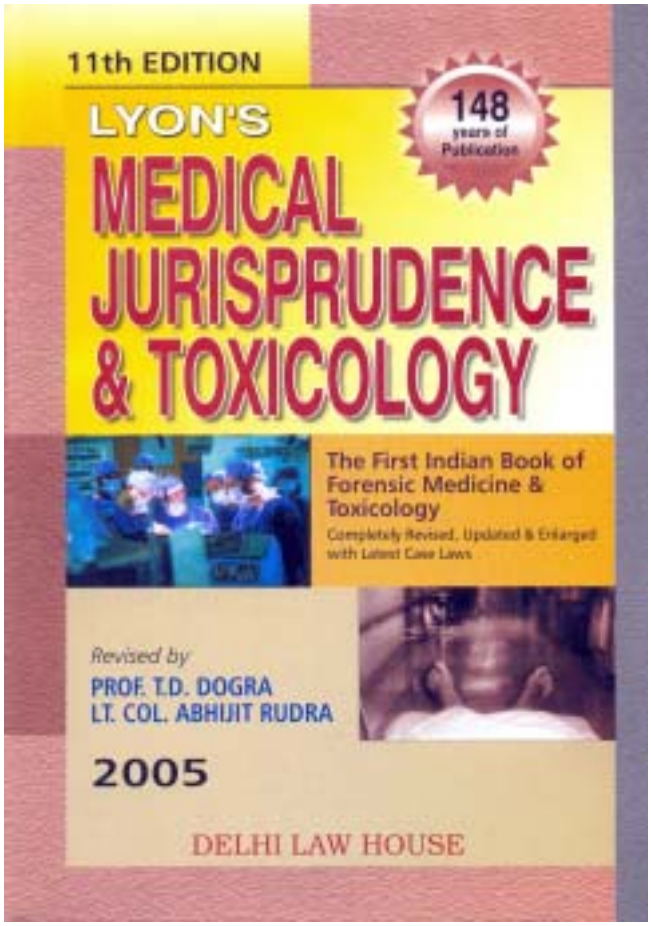
BOOK REVIEW

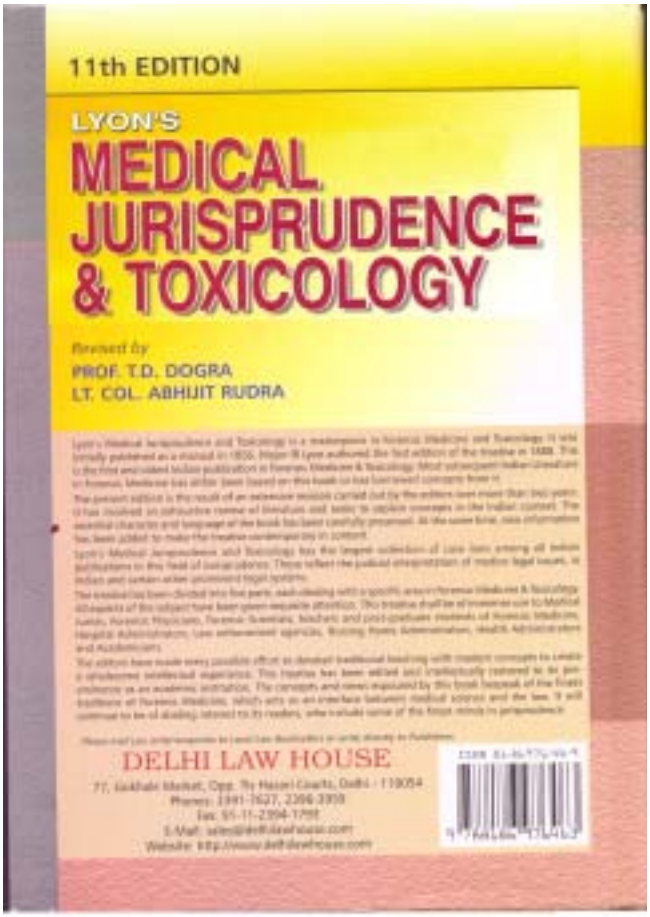


The book Forensic Medicine and Jurisprudence (Simplified and new Look) written by well known Dr.B.V.Suramanyam is a handy book which has covered all the topics needed for undergraduates. The book is suitably illustrated. It has the advantage of inclusion of multiple choice questions and answers which will help students preparing for competitive examinations. It has a nice look, good quality printing and is conveniently priced at Rupees 300. Various forms and certificates used by forensic Medicine experts have also been suitably appended in this book. Latest in the field of Forensic Medicine has also been included to make this book up to date. This book will be of immense help to the students and persons interested in Forensic Medicine.

Dr. R.K.Gorea

BOOK REVIEW





Lyon's Medical Jurisprudence and Toxicology 11th edition

This popular book was first written by Lyon in 1856. As per the tradition of this book which had been previously edited by illustrious specialists from the Indian Medical Services and the Army Medical Corps, now this book has been revised by the most popular personality in the field of forensic Medicine in India Dr. Dogra and by a budding forensic expert Lt.Col.Rudra. He has incorporated his vast personal experience in this book. This exhaustive volume of Forensic Medicine includes all the current topics of the subject. This book has the specialty of explaining the various relevant laws in detail interspersed with the latest case laws.

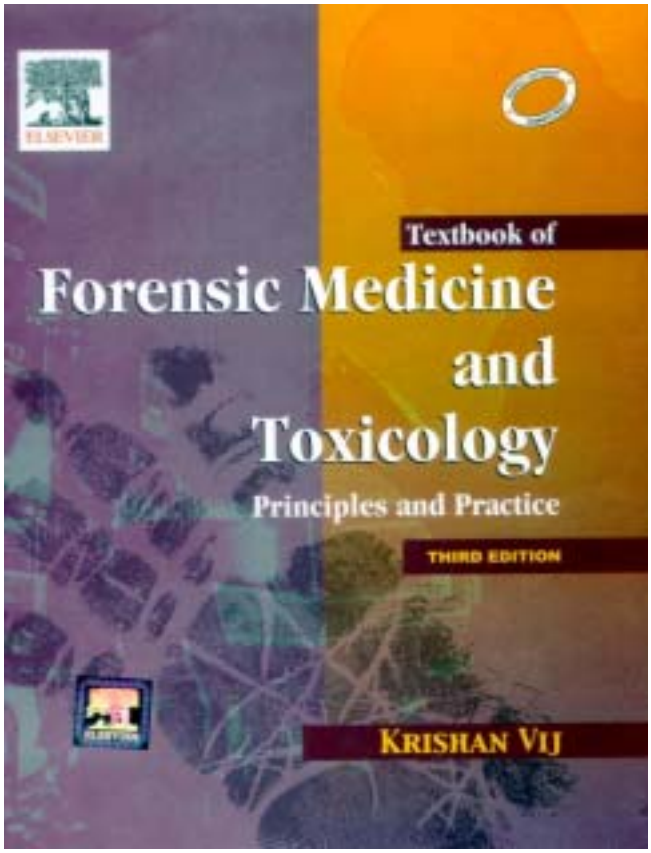
It has the latest in the field of forensic medicine and has described beautifully the mass disasters torture medicine, DNA fingerprinting, rights of unborn child, regulation of heath sector in India, biomedical waste disposal and injuries due to acts of war.

Toxicological section has the most relevant chapter on agrochemical poisoning, the most prevalent poisoning in our agricultural dominated country. A plentiful subject index has made finding required information very easy.

Now postgraduate students have a book without which their studies will always remain incomplete. Undergraduates will also find this book very valuable. This book has been printed nicely with very useful illustrations and photographs. This treatise will also be of immense use to the courts and lawyers in reaching the right conclusions.

Dr.R.K.Gorea

BOOK REVIEW



Text Book of Forensic Medicine & Toxicology (Principles and Practice)

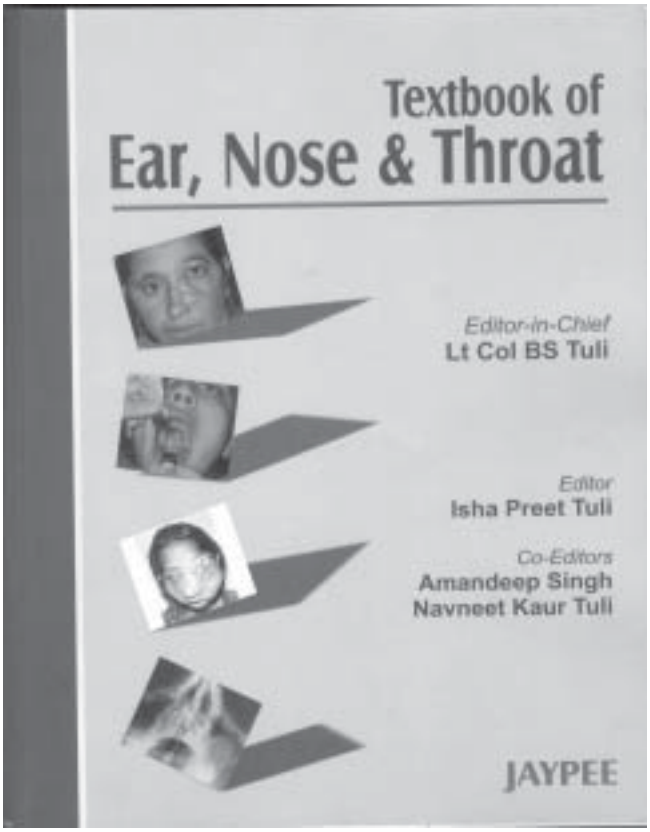
The book written by Prof. Krishan Vij, Head of Forensic Medicine & Toxicology, Govt. Medical College & Hospital, Chandigarh, is a distinct departure from the other available books on the subject and is oriented towards practical problems encountered during day-to-day medico legal work. It is an embodiment of author's experience of more than two decades and his knowledge of law has enabled him to present the subject matter in such a way as to help the readers to unfold intricacies required in responding to queries of the Investigating Agencies.

It carries exclusive chapters on Clinical Forensic Medicine, Medical Negligence, Legal Aspects of Medical Practice; Medico legal & Social Aspects of AIDS etc. constitute another vital feature of the book, needed so acutely in the existing scenario. Inclusion of chapters on Torture Medicine, Deaths related to Anesthesia & Surgery, Anaphylactic Deaths and detailed medico legal discussion on Transplantation of Human Organs Act, Pre-conception and Pre-natal Diagnostic Techniques (Prohibition of Sex Selection) Act, Medical Termination of Pregnancy Act, Drugs and Cosmetics Act speaks of author's concern for disseminating information about recent advances in the field.

Enriched with all such features, this is an ideal text book for undergraduate medical students. Postgraduate students, In-service doctors, Solicitors, Investigating agencies and the Judiciary would also find it an excellent reference source.

Dr.R.K.Gorea

BOOK REVIEW



It is a matter of pride for the Dept. of ENT, GMC, Patiala, that Dr Lt Col B S Tuli has authored "Text Book of ENT". The book has been published by renowned – JAYPEE Medical publishers, New Delhi. Contributions of some chapters have been made by distinguished ENT surgeons of AIIMS, New Delhi, LHMC, New Delhi, Udhaipur Medical College, GMC, Srinagar, GMCH, Chandigarh, IGMC, Shimla, PGIMS, Rohtak, DMC, Ludhiana, GMC, Amritsar and faculty members of different departments of GMC Patiala.

Salient features include 95 chapters concerning diseases of Ear, Nose and Throat, besides Skull Base, Thyroid gland, Radio diagnosis, AIDS, Computer applications, Yoga in ENT, Proptosis, Signs, tests and stalwarts of ENT, Medicolegal aspects and Histopathological Diagnosis in ENT. Appendices include: How to present a long case?. ENT diseases in relation to age & sex, Antibiotics, dosages & side effects.

It has nearly 450 colored photographs, flow charts, latest trends in surgical procedures and salient key points at the end of each chapter for a quick revision. Presentation of the book is excellent and it has been very reasonably priced.

This book is surely going to be very useful for undergraduates, postgraduates and general ENT practioners.

Dr Chander Mohan
Professor and HOD,
Dept. of ENT,
Govt. Medical College, Tanda (HP)