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EDITORIAL

EXTENDING SERVICES BEYOND A TRADITIONAL FRAME : THE ROLE OF A UNIVERSITY FORENSIC DEPARTMENT

Dr. Induwara Gooneratne

This paper identifies the role of a University Forensic Department in extending its services beyond a traditional frame. The arguments in favour of this thesis are formulated focussing the Department of Forensic Medicine at University of Peradeniya. It is reasonably foreseen that any other university department could contemplate in the same lines if they so choose.

A university academic plays a main role in the society and he has multiple functions which include, but is not limited to teaching and training, research and writing, clinical function, curriculum development and revision, conduct examinations, administrative functions, addressing public seminars, consultancies, dissemination of knowledge and publishing, student counselling, maintain student discipline, university welfare appear as expert witnesses to court and so on. It is not the intention of this article to elaborate on the role of the university academic but to outline the functions of a university forensic unit so that the aim of this topic is articulated accordingly into the discussion.

A university forensic unit in Sri Lanka traditionally engages in teaching (both medical undergraduates and postgraduates), research and in provision of medico-legal service function. These three components are important integral and essential components that cannot be compromised in a university forensic unit. However there are opportunities scope and an obligation for a university department to extend the services beyond these limits.

A University Forensic department is different from that of a hospital judicial medical office in many respects including but not limited to university unit's obligation to generate new knowledge, teach and train, disseminate knowledge, research and award, degrees and qualifications.

The department of Forensic Medicine extends its expertise and services to many other faculties including the Dental faculty (in teaching forensic dentistry and clinical Ethics), to the Faculty of Allied Health, and to the Faculty of Arts. In addition, the department extends its services to other university forensic units in conducting teaching and examinations.

The department started a Diploma course in forensic medicine for lawyers and judges. This was necessary as the officers of the courts require to understand the medico-legal report and medical evidence in order to apply them in their legal case. According to the feed-back received, this course was immensely useful to legal practitioners in their day today work.

The academic staff of the department are frequently invited as resource people for many medico-legal seminars and workshops. This enables the department to reach a focus group in disseminating their expertise. Further engaging with media in discussing medico-legal issues paves the way to reach a wider audience.

At the time when I presented and defended the Diploma course in Forensic Medicine for Lawyers and Judges at the University senate, the members of the senate requested me to expand this diploma course not limiting only to medical and legal practitioners. Having considered this I have proposed to the department that at least a

certificate course in forensic medicine and science should be offered for those who are interested. These include coroners police officers, prison officers, media personal, sociologists and criminologists. Also students of other faculties could follow this course and credit it to their degree, if and when the university opens up transfer of credits from different faculties or it could even extend to other university students face to face or via distant mode. The aim of this certificate course is to provide basic knowledge in forensics to those who are interested. This will provide an opportunity for the interested public to upgrade their knowledge in an area they like for any reason including their personal interests. One ought not to fear as this basic course will not provide any authenticity to practice any discipline of forensics.

A training program and a series of seminars on DNA in forensic practice was conducted through the department for police, coroners, lawyers, medical officers and scientists etc. These series were also very popular and participants from many different places from Sri Lanka attended.

Several seminars on medical ethics were successfully conducted on invitation for numerous audiences including medical officers, dental officers, academics, students, allied health workers, philosophers general public etc.

Another idea that came to my mind was to have a permanent exhibition centre for forensics at the department which will be open for public. This was proposed to the department and the department agreed on principle. I am sure this will be a success as the forensic stall – "Justice through Medicine" (I had the opportunity to chair the forensic committee of the exhibition) won a prize at the last medical exhibition that brought many thousands of people to come and enjoy the different aspects of forensic practice. The proposed venue would be the existing forensic medicine department at Peradeniya when we move to the new building.

Many lawyers and judges who are in rural areas find it difficult to travel to Peradeniya for the diploma course in forensic medicine. Considering this difficulty I proposed to the department that we can provide extension courses such as the Diploma in forensic Medicine course and the certificate course "on line". The philosophy is that when it is difficult for the participant to travel, we the faculty visit them online! With my experience abroad in teaching in a prestigious medical school and having had training in face to face, online and distance learning, we would be able to offer a unique course in forensics which both undergraduates (if they wish to) and others could benefit. This requires additional preparing, computer professionals moodle or blackboard interfaces and commitment.

At the moment we have adequate learning materials, details of curriculum and a self learning package for undergraduate medical students in our departmental web which include learning materials and self evaluation of the subject. This helps student's active learning.

The next is to engage in advanced multi disciplinary research beyond mere case reports writing. This requires team work, collaboration, training, research and commitment.

Now that the department is having service function extents to all seven days of the week at Peradeniya teaching hospital, with the help of the clinical staff in the department it is possible to expand the postgraduate teaching. In the future with the opening of the proposed human identification unit in the department along with a DNA laboratory which will serve at least the central province.

As forensic pathology is relatively well developed, there is an obligation by university forensic departments to initiate and develop other forensic specialities, such as forensic sciences. It is a requirement that all parallel forensic sciences develop simultaneously to administer justice. It is

my view that a university forensic unit engages personnel from relevant other forensic specialities also in order to approach a medico-legal case as a team. This will not only facilitate team approach in solving a medico-legal issue but also encourage collaborating research in forensics and also help to develop forensic degrees and courses in all forensic disciplines through the university forensic unit. A forensic lawyer too will be an added assert to a university forensic department. These are existing voids in our system which need urgent attention. However, this expansion needs to be done NOT compromising quality and/or quantity of undergraduate and postgraduate medical teaching. With this proposed model it is not only possible to approach a medico-legal case as a team but also provide a multi-faceted, multi-specialized research environment at the university. This approach de-compartmentalizes forensic specialities and converge different experts to a common goal in a common ground. In this way we can have one forensic unit in a university with multiple experts belonging to different areas of specialities serving a common goal which is education and administration of justice as a team. Also this model helps universities to conduct several forensic degree courses in different specialities from one department of study apart from solving a medico-legal problem as a team in the same venue. This provides a unique environment to students from all areas of forensic specialties and demonstrate a team environment. A unique example of this model exists in the Victorian Institute of Forensic Medicine in Australia and in Adelaide Forensic Unit.

These are some of the ways we can extend our services beyond traditional frame work and engage public and educate the community for which we need man power, resources commitment and a positive attitude. These are all possible extra endeavours beyond the routine service function teaching and research commitments of a forensic department.

THE MANAGEMENT OF "UNKNOWN" OR "UNIDENTIFIED" DECEASED ALLEGED TO BE INVOLVED IN ROAD TRAFFIC ACCIDENTS; ARE WE HELPING ADEQUATELY TO PROVIDE JUSTICE TO THEM?

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INTRODUCTION

In modern societies identification of human remains and ascertaining the cause of death are necessary for legal and social reasons[1]. In a case of an alleged traffic accident the need is highlighted more as the damage to persons and property can lead to compensation issues and implementation of preventive measures. Proper management of "unknown" or "unidentified" body remains due to trauma is a challenge to any medico-legal system since it involves several stake holders namely, the Police, Judiciary, Health Servicers, Local Authorities, Funeral Services as well as the loved ones of a 'missing person'. The management includes storage of the body in a refrigerator, initiation of investigations, identification of the individual, getting an order to conduct the autopsy, post-mortem examination, reporting and burial of the deceased. Issuing of a magistrate order stating the remains to be stored in morgue freezers until the appearance of relatives has created a huge problem where the freezers are almost always overcrowded and not functioning at their optimum conditions. This in turn led to cascade of events where the investigation becomes a fruitless exercise. The two cases given here highlight the issues.

Case Report-1

A male involved in a "hit and run" by a van was subjected to a post-mortem examination 6 months later by a magistrate order. Although body was brought to the mortuary in a relatively fresh state for refrigeration by the time of the autopsy, it was highly putrefied [*Figure:1*]. The soft tissues were liquefied and large collections of dead maggots were found. There were no bone injuries. Skeletal examination revealed the estimated age between 30-40 years. The cause of death was given as unascertainable.

Case Report-2

An autopsy of an "unknown" pedestrian involved in a road traffic accident was conducted 4 months later after refrigeration. According to the police information the deceased was a destitute hit by a speeding vehicle while crossing the road at yellow lines. The body was in an advanced state of putrefaction at the time of the autopsy. Skeletal examination revealed fracture of the cervical spine at C4 level and multiple rib fractures. [*Figure:2& 3*] Cause of death was given as multiple injuries to the neck and chest based on skeletal injuries. Collection of data for specific identification from soft tissue was impossible and only option was obtaining a DNA sample.

DISCUSSION

Post-mortem examination of a deceased where cause of death is related to trauma, if not examined early may lead to various problems especially in injury interpretations. Post-mortem changes are well known for their possible misinterpretation as traumatic lesions and vice versa and therefore early examination of the body is the recommended practice[2,3,4].

The first step of the management of the "unknown/ unidentified" body is finding a hospital with "refrigerator" facility to store the body. In routine practice the Police publish information of the deceased in media and give some time for the relatives/next of kin to come forward for identification. The time duration given to identify the deceased by relatives varies according to the stake holders involved in the process. However, when the Magistrate issues an order for post-mortem examination it is not only to find the cause of death but also to establish the identification of the deceased. Order for an autopsy usually issued along with a burial order to use the Government funds to burry if no relative comes forward to claim the remains.

The two case reports highlight few common issues related to the management of the 'unknown' involved in road traffic accidents. Although the bodies were "refrigerated" they undergo putrefaction leading to many other problems to the system simply because the refrigerators were not functioning in their optimal conditions due to overcrowding [*Figure: 4,5,6*]. One of the most important issues is difficulty in interpreting injuries thus leading inability to find a cause of death which in turn will lead to problems in serving justice to the dead.

The issues faced by pathologists and hospital administrators due to delay in obtaining a Magistrate Order are collection of "unknown" bodies in the freezers leading to overloading of refrigerators, mechanical failure of the refrigerators, decomposition of the bodies, unbearable ordure in the mortuary and hospital, maggot infestation, environmental and health issues, and logistic problems to the systems. Problems related to hospital mortuary freezer overcrowding is a universal problem[5,6,7]. Although many may interpret the problem as a consequence of poor funding and capacity, the management failure also play a significant role[6].

Sri Lanka is a tropical country that enhances putrefaction of the bodies quickly due to high temperatures, especially those where exposed to the environment even the body is refrigerated later. Refrigerator/freezer facility is any way poor in majority of hospitals in Sri Lanka. Inadequate funding for their maintenance further worsens the situation. Overcrowding of freezers due to management inadequacy of the burials/cremations of body lead to cascade of events where the freezers come to the level of mechanical failure, enhancing the putrefaction more.

Therefore, the need of standard operational procedures for the management of 'unknown' involved in road traffic accident is felt more and more if we are to give justice to the deceased and the society. Currently Sri Lankan medico-legal investigators lack operational procedures in the investigation of "unknown/unidentified". Hence, practiced operational procedures vary from one hospital to the other leading to different standards even among specialist's investigations.

CONCLUSION

Thus, my suggestion is that the Magistrates to issue orders for a post-mortems of the 'unknown' involved in traffic accidents to be conducted with 2-3 days to ensure a quality work from the pathologist, considering the cause of death. Further, I suggest the data related to identification of the deceased to be done methodically according to "Disaster victim identification form" developed by Interpol which in turn can be compared with data from the "missing individuals" properly. Therefore, time has come to develop standard operational procedures related to management of the unknown involved in trauma if we are to help serving justice to them.

Figure: 1-Putrefied body

Figure: 2 - Traumatic injuries- Rib fractures in putrefied body

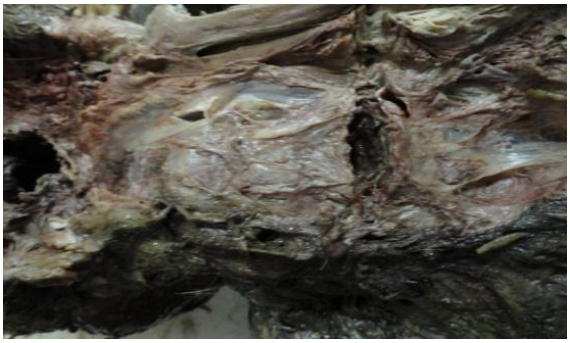

Figure:3-Traumatic injuries-cervical fractures in putrefied body

Figure: 4- overcrowding – two bodies in one tray

Figure: 5 - Overcrowding – two bodies in one tray

Figure: 6- purified fluids damaging refrigerators

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A CASE OF SUDDEN DEATH FOLLOWING MINOR INTENTIONAL TRAUMA; PATHOLOGIST'S CONTRIBUTION IN THE DECISION ON THE MANNER OF DEATH

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INTRODUCTION

Sudden death following trauma arouses a huge public interest. This in turn leads the investigators to take stern actions at the outset. Thorough post-mortem examination by a pathologist is an essential part of the medico-legal investigation of such deaths. A seemingly direct violence related death can end up as a natural death at the end of the post-mortem examination[1]. Similarly there can be limitations to the opinions that can be expressed by the pathologist at the end of the post-mortem examination for forensic pathologists are not Sherlock Holmes. We report a case of a man who died immediately after trauma due to a natural disease.

Case History

A 70 year old man with a history of ischemic heart disease and a bypass surgery one year back has had a verbal argument with his neighbor. Following the argument it was witnessed that a stone being thrown at him. He was found collapsed few minutes later and was brought to the hospital. It was found that he had no vital signs but only a broad irregular rhythm in the electrocardiogram. Suspect was taken into custody and an autopsy examination of the body was ordered.

Information about the scene revealed no excessive blood loss. Post mortem examination revealed a laceration on the occipital area without any skull fractures or intra cranial injuries [*Figure: 1*] and a few grazed abrasions on the back. There was no pallor in his internal organs or conjunctivae. There was marked hypertrophy of the heart with ischemic scarring and an organizing myocardial infarction which was evident histologically [*Figure: 2*]. There were chronic hypertensive changes in kidneys.

Cause of death was ascertained as ischemic heart disease in a man with a scalp laceration.

DISCUSSION

Sudden natural deaths associated with minor trauma are not uncommon in forensic practice[2]. Though it is a common occurrence for a man to die suddenly following emotional disturbance and trivial trauma with pre-existing heart disease,[3] the forensic pathologist is faced with a dilemma of explaining the court and the agitated relations how the former condition affect the latter resulting in death.

The head injury in this man is minor and only involves partial thickness of the scalp. Though rare, there are reported cases of sudden deaths associated with scalp lacerations. Cases have been reported where there is extensive bleeding from a scalp wound in association with other coexistent pathologies[4]. However, there was no autopsy evidence of pallor in this man to suggest considerable blood loss. Information obtained about the scene revealed that there was no excessive blood loss.

It is also predictable that this elderly person could have succumbed to his pre-existing heart disease at any moment[5].The heart of this man was over 900 g and there was pre-existing scarring and an organizing myocardial infarction as well. Myocardial hypertrophy, scarring and infarctions are identified risk factors for sudden fatal arrhythmia[6,7].

However, the contribution to death from minor trauma and emotional disturbances associated with verbal arguments and pain cannot be excluded in this case. The stress of a verbal argument as well as any minor traumatic incident can lead to increased secretion of catecholamine which in turn can result in increased heart rate leading to fatal arrhythmia[8,9]. Possible pro-arrhythmic mechanisms associated with emotional and physical stress include alterations in autonomic tone manifested by decreased vagal and increased sympathetic components, this in turn increases the overall susceptibility to

ventricular fibrillation specially in individuals with pre-existing cardiac disease[10].

In forensic literature, sudden death of a man resulting from exacerbation of pre-existing heart disease that is induced by physical and/or emotional stress of a criminal activity of another person is sometimes referred to as "homicide by heart attack."[11] In such circumstances it is necessary to prove that the emotional and physical stress associated with the criminal activity of another person was contributory to the death.

In this case, pathological investigations revealed that this man has a severe cardiac disease and a minor trauma. Historical investigations revealed that he had collapsed immediately after the assault. Based on scientific knowledge and considering historical and pathological evidence we can conclude that there is a definite contribution to his death from trauma. Thus, the cause of death was concluded as ischeamic heart disease in a man with a scalp laceration.

However, the contribution the pathologist can make in determining the manner of death is limited. Decision on culpability of the assailant is based on *mensrea* or the guilty mind which is the mental element of the offence. The mere simple non grievous nature of this injury does not necessarily mean that the assailant is not having an intention of causing death. It is beyond the expertise of the forensic pathologist to determine the knowledge of the assailant about the pre-existing conditions of the victim and his intention of causing any act that would likely to cause death.

CONCLUSION

The decision on contribution of non grievous injuries to the death of this man with a lethal heart disease is crucial. Pathologist's contribution in forming opinions can be limited. The scientific knowledge of the pathologist as well as the legal evidence of mensrea or guilty mind may jointly play a role in prosecution of this case.

Figure: 1 - Scalp laceration on the occipital area

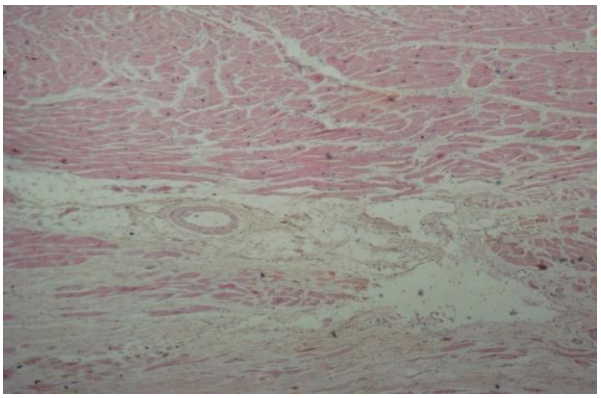

Figure: 2 Myocardial fibrosis with chronic inflammatory cell infiltration

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DO THE PRINT MEDIA HELP THE MEDICAL SCIENCE? AN ANALYSIS OF FORENSIC RELATED CONTENTS IN NEWSPAPER ARTICLES

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INTRODUCTION

General public get a considerable amount of information about medical science related topics from the media. Communicating with the public through the media can be vexing for medical professionals because they lack direct control over the final reporting[1].It is the reporter's view of the information and his or her words that reach the public, rather than the scientist's or the clinician's. Moreover, there is a mismatch between the expectations of the scientist and those of the reporter. Scientists expect journalists to share their concern with scientific norms relating to the provisional nature of scientific knowledge and recognition of the collegial nature of scientific endeavour[2]. However subspecialty such as in forensics there are diverse concerns about published material in the print media. Issues are more or less the same in other specialties as well.

Forensic science related incidence and crime reporting has to be done with an intention of giving important message to the public and to serve the criminal justice system in the country. From the public perspective, newspapers are a major source of information in a country like Sri Lanka having quite high literacy rate. The news should impart knowledge, influence the understanding of issues by their readers and may also act as advocates for the recipients of news items[3]. But this ideal situation is unfeasible some times; the public cannot understand the language of a scientific enterprise. There are different perspectives in writers mind and editors of the print media. On the other hand even scientists have trouble communicating across sub disciplines and with media and public. Given that the ideal cannot be realized, what standards should be used for judging reporting about medical science and how well is the current reporting in the print media needs consideration.

Reporters need to gain newspaper space (and ultimately an audience) for their topics, so they are prone to include sensationalistic, absolutist or at least dramatic statements. This drive conflicts with the norms of science journalism, which encourage cautious, detailed, balanced reporting, thus reflect the norms of the science that is covered[4]. While various existing codes have some differences most share common elements including the principles of truthfulness, accuracy, objectivity, impartiality, fairness and public accountability[5,6,7]. One of the leading voices in the United States on the subject of Journalistic Standards and Ethics is the Society of Professional Journalists. The preamble to its Code of Ethics states public enlightenment is the forerunner of justice and the foundation of democracy. The reporting in relation to forensic contexts involves rights of the victims, assailants, and their families. Analysis of forensic contents and ethical aspects of reporting on newspapers will give an insight of the current trend.

OBJECTIVES

The general objective of this study was to assess the reporting of forensic related contents on newspapers. The specific objectives were to identify the forensic related contents appearing in Sri Lankan newspapers and to analyse the ethical reporting of the contents.

MATERIALS AND METHOD

Forensic related news items and articles numbering 440 were reviewed from published contents of two leading Sinhala and English newspapers in 2009 and 2010 between December 1st and May 31st. The content analysis was carried out on Forensic related crimes and ethical aspects of reporting them. The scrutinized data was extracted into a pre-planned work sheet and analyzed using SPSS 10 computer software.

RESULTS

Figure: 1

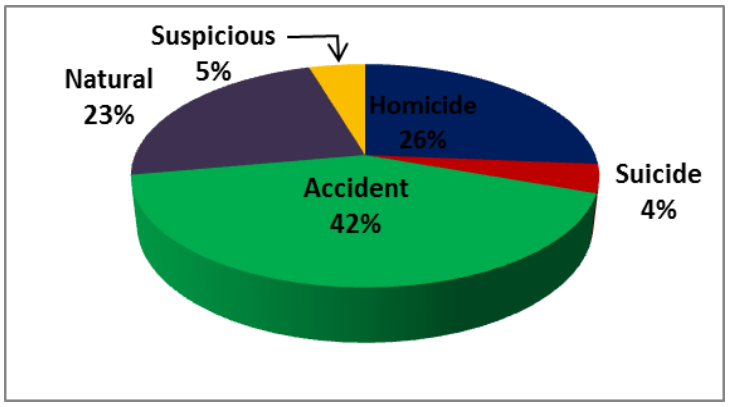


Figure: 2

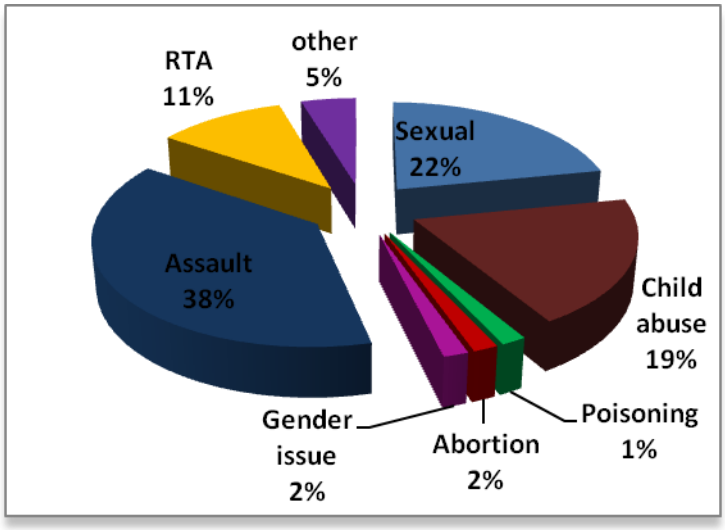
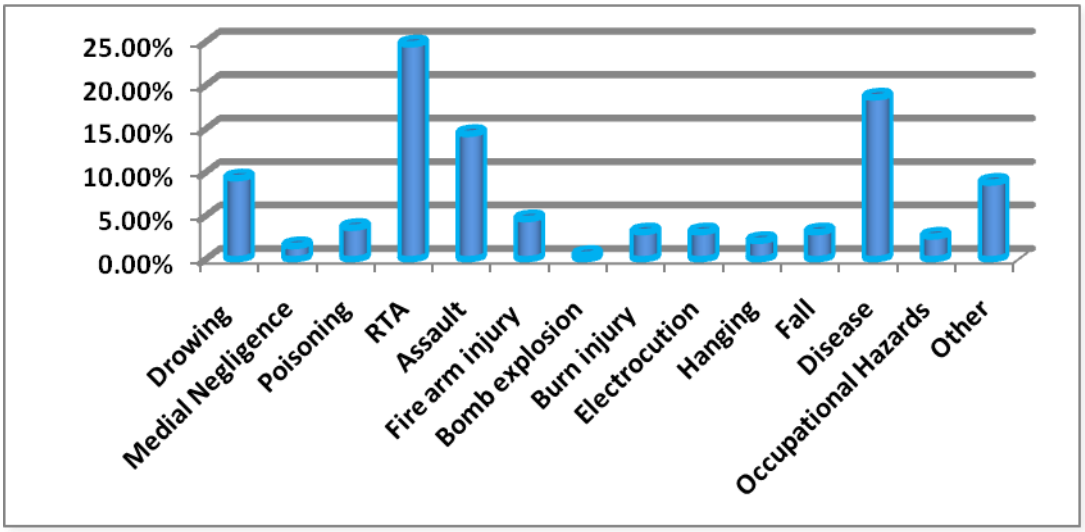


Figure: 3



Majority of the Forensic related articles were written by a person from the paper (73.4%). Most of the forensic related contents appeared as news items (86.6%) and the rest as feature articles (13.4%). In majority of Forensic Pathology cases the circumstance of death was due to accidental causes [*Figure: 1*]. The cause of death in majority of Forensic Pathology cases was road traffic accident. [*Figure: 3*].

The majority of reported clinical cases were due to assault, sexual and child abuse. [*Figure: 2*] The ethical aspects revealed majority of the forensic content was without sensationalisation (75.5%). Only 28.4% of the content provided the whole facts related to an incident. The source of information was revealed in 50.5% of the forensic content.

DISCUSSION

Forensic science related incidence and crime reporting has to be done with an intention of giving important message to the public and to serve the criminal justice system in the country. From the public perspective, newspapers are a major source of information in a country like Sri Lanka having quite high literacy rate. The news should impart knowledge, influence the understanding of issues by their readers and may also act as advocates for the recipients of news items[3]. The statistics related to violence available at the police department for the year 2010 closely depicts the forensic related news items appeared in the newspapers. Newspapers are giving coverage mainly as news items and the Forensic related contents are authored by nonmedical people. Therefore with relevance to forensic context they lack the expertise and knowledge to report matters concerning to different medico legal issues and thus may result in false interpretation of facts. This can result in pain and agony for the immediate family members when the facts get distorted.

According to this study the ethical aspects of reporting was to most extent adhered by the authors. The often expected sensationalisation was not explicitly found even though Forensic Medicine is an area for sensational reporting. In contradiction only a small percentage of news items (28.4%) provided the whole facts related to the incident. The concept of balanced reporting for the general public to decide was less visible with regard to forensic contents. Therefore whether this would indirectly promote sensationalisation is questionable. At the same time the availability of spacing for forensic content in a newspaper would have compromised the reporter to restrict on important matters. The lack of space for forensic related contents was proven by this research where majority were news items found in a small space (73.9%) and most of the forensic related items occupied the middle pages of a newspaper (89.5%).

The expected duty of the newspapers to educate public and give suggestions to improve the criminal justice system with regard to forensic medicine related matters was found to be not satisfactory. The lack of interest shown by the papers in this regard may be due to several reasons. The forensic news items carry an interest in relation to crime than health education. The general public must stress the need to approach crime related events in a balanced as well as educative manner.

CONCLUSION

Only a small percentage of Forensic contents appeared in newspapers gave recommendations to improve the criminal justice system and educate public. The Sri Lankan newspapers abided by the ethical reporting of forensic related contents in most publications.

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DECLARATION

We wish to declare that the abstract of this paper was accepted for poster presentation at the 10th Indo-Pacific Congress on Legal Medicine and Forensic Sciences 2010.

DEATH DUE TO ADULT RESPIRATORY DISTRESS SYNDROME FOLLOWING ASSAULT WITH 'RUBBER ACID': COULD IT HAVE BEEN AVERTED?

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INTRODUCTION

Adult respiratory distress syndrome and chemical pneumonitis are well documented effects of exposure to chemical fumes. Many organic and non-organic agents cause chemical pneumonitis[1]. The course of the disease depends on the nature of the chemical agent, intensity and duration of the exposure and the interval between exposure and start of treatment[2]. Also the site of damage tends to vary with the gas involved; gases with higher water solubility being effectively scavenged by the upper respiratory mucosa, while insoluble toxic gases have their effects on the lower respiratory mucosa[3].

Rubber acid refers to both formic acid and acetic acid[4]. Both acetic acid and formic acid[5] are used in the rubber industry as a coagulant for natural rubber latex and form making, and as a preservative of latex. Most of the forensic medicine books in Sri Lanka consider rubber acid to be acetic acid[6,7]. However in Sri Lanka, the most commonly used acid in the rubber industry is formic acid[8] and both formic acid and acetic acid are easily accessible in areas with rubber plantations.

Burns due to acid assault are the most common form of chemical burns in Sri Lanka with most victims being in the young and productive age group[8].

We report a case of inhalation injury due to 'rubber acid' to highlight the differences between the two acids used, and abused, in the rubber industry.

Case report

'Rubber acid' had been thrown on the face of a 23 year old, healthy male by three known men. He sustained acid burns on the face, chest and upper limbs. He was admitted to local hospital immediately and was transferred to the National Hospital of Sri Lanka (NHSL) on the same day.
He had no loss of consciousness, fever or breathing difficulty. Burn surface area was calculated to be 14%. As the patient suffered from extensive burn injury to the right eye with involvement of the cornea, he was transferred to the Eye Hospital. On Day 7 the patient developed fever with chills, rigors and cough associated with yellowish sputum and was transferred back to NHSL. On Day 8 he was started on intermittent positive pressure ventilation due to increasing respiratory distress. Swabs from the wound were positive for coliforms and *Staphylococcus aureus*. On day 12 he developed cardiac arrest with ventricular fibrillation and died.

Post mortem examination revealed acid burns of the right side of the face, neck, front of chest, upper part of the right arm and the middle one third of anterior and posterior aspects of left forearm. Right eye showed extensive acid burns on the eye lid and cornea. Right side of the nose, entire mouth and right ear also had acid burns.
Larynx, trachea and bronchi were congested and filled with thick yellowish secretions. Lungs were heavy and solid with right and left lungs weighing 1200 grams and 1000 grams respectively. Surface of the lungs was nodular with fibrin tags. Cut section showed congested, haemorrhagic lungs with a variegated appearance involving all areas. On examination of the heart a pale area was found in the left ventricle and apex. There was no fibrosis and the valves were normal. A small subarachnoid haemorrhage was found over the left temporal lobe. Liver, spleen, kidneys and supra renal glands were enlarged.

Microscopic examination of the lung showed confluent haemorrhagic bronchopneumonia and diffuse alveolar damage consistent with acute respiratory distress syndrome. Brain showed marked congestion with multiple areas of minute haemorrhages. Other organs were microscopically normal. Death was attributed to adult respiratory distress syndrome due to bilateral bronchopneumonia due to chemical pneumonitis following inhalation injury caused by acid.

DISCUSSION

Adult Respiratory Distress Syndrome (ARDS) is a complex clinical, radiological and physiological syndrome. Toxic chemical inhalation, severe bacterial pneumonia and aspiration of stomach contents are well known causes of ARDS[9].Both formic acid and acetic acid can cause adult respiratory distress syndrome, but the different chemical properties of the two chemicals may change the course of the disease in each case.

Formic acid (CH_2O_2) is a volatile, colourless, medium strong acid with a pungent odour[10]. Since the relative density of the vapour/air mixture at 20^0C is 1.03, harmful contamination of air can occur rapidly on evaporation of this substance[10]. The evaporation would be more in Sri Lanka, as the normal environment temperature is around 27-30°C.

Formic acid can be absorbed into the body by ingestion, by inhalation or through the skin. The substance is a severe irritant to the eyes, the skin and the respiratory tract[11]. Formic acid is more caustic to the skin than acetic acid[12]. Skin absorption can cause serious skin burns. Systemic toxicity has been reported in patients who presented with skin burns[13]. Inhalation of the vapour can cause pulmonary oedema, swelling of the airway, and respiratory distress[10]. Pulmonary aspiration with secondary pneumonia may occur. Occasionally direct chemical pneumonitis may also occur[14]. Splashes of formic acid in the eye have caused permanent clouding of the cornea, with loss of visual acuity. Ingestion causes ulceration of the gastrointestinal tract, which results in perforation and peritonitis and late scarring of structures of the gastrointestinal tract. Major complications are acute renal failure and disseminated intravascular coagulation[14].

Most reported cases of formic acid poisoning in Europe,[13] India and Sri Lanka involve accidental or intentional ingestion. Due to the volatile nature of the acid, respiratory complications, such as toxic pneumonitis have been reported in patients who presented with formic acid ingestion[15,16]. Mathew and Dalus studied 302 patients admitted with formic acid ingestion and found that 44% had respiratory distress, 70.2% had metabolic acidosis, 47.4% had aspiration pneumonia, 33.8% had ARDS and 25.5% had chemical pneumonitis[17]. This shows that respiratory distress is significantly associated with morbidity even in cases of ingestion. Another study reveals that several patients who died due to formic acid ingestion, had evidence of widespread pneumonitis at autopsy[16]. Formic acid inhalation injury can lead to Reactive Airway Dysfunction Syndrome (RADS), within hours[18]. A case has been reported where a worker splashed in the face with formic acid developed respiratory distress and dysphagia, and died within 6 hours.

Acetic acid, in contrast, is a weak acid, which is also colourless with a pungent odour. The substance is corrosive to the eyes, skin, respiratory tract and gastrointestinal tract. Inhalation may cause lung oedema, which is a late manifestation[19]. In a study done to evaluate acute irritation during controlled exposure to vapours of acetic acid, no significant exposure related effects on pulmonary function was seen[20]. However pulmonary effects are seen in workers exposed to higher concentrations of acetic acid. In a setting where, a total of 56 hospital employees were exposed to glacial acetic acid after an accidental chemical spill, 0% subjects with low exposure, 3.3% with medium exposure, and 21.4% with high exposure, developed RADS.[21] Reversible airways obstruction and steroid responsive interstitial pneumonitis has been reported after exposure to glacial acetic acid. However case reports on deaths due to acetic acid inhalation injury are rare in the medical literature.

According to the Experimental officer, Rubber Research Institute, Sri Lanka (personal communication, A. K. D. Warnajith), both formic acid and acetic acid are used in the rubber industry. However the concentration of formic acid used in the rubber industry is 1%, whereas 85% formic acid is freely available in the market. Similarly 98-100% acetic acid is available in the market though only 2% acetic acid is used in the rubber industry.

Out of the two acids formic acid is the most commonly used acid. Rubber research institute encourages the use of formic acid because of its anti-fungal effects but the popularity of formic acid may also be due to its low price. However the potential health effects of formic acid is far more lethal than that of acetic acid. Therefore, if concentrated formic acid was not available to the general public this death could have been averted.

In our patient the chemical nature or the strength of the acid was never ascertained; being referred to as rubber acid. Establishing the type of acid involved, would have been important in predicting the course of the disease, though it may not have affected the management. But it is of great

importance to the forensic pathologist, to know the exact acid involved, since the course and the severity of the disease changes with the acid.

In most cases of inhalation injury, as in this patient, only a few signs of inhalation injury are found on admission. But these patients tend to develop a prolonged clinical course requiring long term artificial ventilation and severe pulmonary complications[22].

RECOMMENDATIONS

The rubber industry and the general public need to be informed about the serious health consequences of Formic acid in comparison to Acetic acid. The support of the rubber research institute and the government should be enlisted to restrict the availability of both 85% formic acid and 98-100% acetic acid to the general population. Strict regulations should be introduced for sale and distribution of the concentrated acids. The use of acetic acid in the rubber industry should be encouraged and formic acid phased out.

Inhalation injury should be suspected, especially in cases of facial burns, and treatment should not be delayed.

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THE NEED FOR EFFECTIVE COMMUNICATION SKILLS IN THE MEDICO - LEGAL MANAGEMENT OF CHILD SEXUAL ASSAULT VICTIMS: OBSERVATIONS FROM THE SRI LANKAN CONTEXT

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INTRODUCTION

The medico-legal management of child sexual assault victims consists of a detailed history taking, physical examination, photography, obtaining forensic samples, proper documentation, explaining the findings to the victim and guardians, and further referral, if needed. Forensic Medical Examiners (FME) who carry out the above functions greatly benefit by having effective communication skills. In fact, these communication skills are and should be an essential component in the skill repertoire of FMEs. Lack of such effective communication skills can lead to repercussions not only to the child but for the doctor himself.

Why effective communication skills?

Obtaining a history from children, especially child sexual assault victims, requires special skills. For instance, in addition to obtaining valid consent from the guardian, history taking should be initiated by asking the child permission to proceed with the interview – a practice that is not commonly seen in the Sri Lankan context. Instead, there are instances where FMEs appear to assume that the child will comply and hence proceed straight onto asking information about the incident. This is not in keeping with effective communication techniques. Obtaining permission from child victims, before history taking/examination, would be a positive experience for the child. In fact, by explaining to the child each of the steps of the medico-legal management, the FME may win the confidence and compliance of the child. Further, there may be some examination findings and management plans that could be discussed with the child, whilst taking into consideration his developmental age. By doing so, it will give him a sense of control over his body and indeed life - a control which he may perceive as lost due to the assault. Indeed, this whole process may assist the child's psychological healing process. Hence, though the doctor may use effective communication skills to facilitate his medico-legal interview, it could have a psychological therapeutic effect on the child too. This is particularly relevant in the Sri Lankan context where mental health service providers such as psychologists and psychiatrists are few in number and many victims may not receive psychological care. Hence, the FME, albeit partially, could fulfil some of these dimensions.

Questioning the child without empathy and communicating with the child without considering the developmental stage may lead to incomplete gathering of data, and worse, may even lead to secondary victimisation. Further, possible psychological complications like depression and suicidality[1] can worsen. In countries with a better developed medico-legal system, only those professionals especially trained in forensic interviewing skills obtain the history from the victim[1]. In fact, some jurisdictions recognize the ability to communicate comfortably and effectively with children and their caregivers about sensitive issues as a pre requisite to become FMEs. These standards, seen mostly in settings where clinical forensic medicine services have greatly progressed, show that the ability to effectively communicate is deemed an essential aspect of a well-rounded FME. However, these requisites are not considered in the Sri Lankan context, and in fact the MD curriculum in Forensic Medicine does not even have a dedicated teaching module or designated teaching hours on communication skills. The authors propose such an inclusion in the curriculum.

The Sri Lankan FME fulfilling duties that may not be traditionally within the purview of his job description

In many parts of the world, child sexual assault victims are routinely referred to a psychologist for psychotherapy and/or to a pediatrician for a general medical examination. However, in Sri Lanka this does not happen habitually, possibly because there is a dearth of such professionals, particularly psychologists. Therefore, the FME could be the only health care professional the

child comes into contact with, and so, the FME may need to, even if cursorily, fulfill some of the tasks that fall within the job description of these other professionals. This imposes an enormous burden on the FME whereby he has to not only complete his forensic investigation but also lessen the physical, if any, and psychological pain of the child.

Within the purview of the practice of Forensic Medicine, effective communication skills are necessary to ensure that the whole truth is divulged. Previous research has shown that those doctors who practice effective communication skills are better able to gather relevant information leading thereby to a superior ability to diagnose and consequently manage the victim. However, beyond the purview of this forensic medicine practice, such skills also help elicit victim's concerns such as fear of further assault and fear of pregnancy. The exploration of and eliciting of such information is not an easy task and requires the existence of many desirable personal qualities within the FME (towards the child victim) – qualities such as empathy, positive regard and non-judementality. Effective communication skills 'grow' within these personal qualities.

False guilt, where the victim thinks he/she is to blame for the assault, is commonly seen among children. Eliciting and addressing these psychological dynamics generally fall within the task of a psychologist. However, due to the few numbers of such professionals in Sri Lanka, FME's may also need to elicit and address these psychological dynamics in the victim. These sensitive and often unacknowledged concerns in the victim may not be easy to penetrate nor to address. However, effective communication skills could come to the 'rescue' of the FME who forges ahead to address these victims' concerns. When these concerns are shared by the victim, the FME can respond appropriately and to some extent allay these fears of the victim thereby contributing to his healing process. However, while emphasising the need for effective communication, with all the necessary skills delineated in this article, the authors acknowledge and reiterate the onus on the FME to maintain impartiality when interacting with victims of child sexual abuse.

The essential communication skills in a FMEs' practice

During the history taking and other aspects of the investigation, three core skills are needed to communicate effectively: appropriate questioning style, active listening and facilitation[2]. These three core skills could be practiced by verbal and/or non-verbal communication ways.

Verbal communication skills

Verbal communication, as the term implies, is related to the effective use of voice and words when communicating. When speaking to victims, whether child or adult, the quality of the voice itself has an impact. Doctors should maintain an appropriate volume, pronounce words distinctly, use a pleasing pitch, vary the intonation appropriately, and keep-up a steady rate of words. It is good practice to use emphasis in the right places[3]. Other than these qualities of the voice, the manner of using word too is important. For instance, rewording is an important verbal communication skill – rewording involves stating back to the victim what he had just reported, but in the FMEs' words. This conveys the message to the victim that the FME listened intently and understood what the victim said. It also gives an opportunity to re-clarify if the FME had understood incorrectly what the victim reported. The verbal communication skill of rewording is best used in instances where the victim reports many facts in one go or/and when he/she reports important information. It is the authors' observation that FMEs' in Sri Lanka may benefit by improving their verbal communication skills.

Non verbal communication skills

Non verbal skills are also called "body language". There are many dimensions of effective body language. For instance, the doctors' seating position should be adjusted to make the victim's gaze comfortable. Sitting at a higher elevation to the victim may convey a sense of superiority and power which may make the victim withhold key information. Maintaining eye contact is another key non-verbal communication and is of paramount importance[1,2,3]. Good use of gaze (looking at an area between the eyes) shows the victim that the FME is interested in the interview process. Further, a relaxed body posture and a slight forward lean would be encouraging and helpful in establishing rapport. Appropriate facial expressions that display concern towards the victim indicate that the doctor is responsive whilst gestures like nodding could be viewed as rewarding to the victim[3].

Questioning, active listening and facilitation

It is in the context of the above mentioned verbal and non verbal communication that appropriate questioning, active listening and facilitation should be endeavored. The interview should not begin with closed questions (i.e. those questions that imply an answer) but with open questions whereby the child has to describe the incident in his own words. Sometimes rewording or rephrasing what the child had told would clarify statements given by him[3] whilst also implying to the child that the FME is being attentive. Closed questions, could be used at the latter stage of the interview in order to obtain specific information. These are especially useful in the withdrawn victim[2]. Only when all open questions have been exhausted, and there appears no other manner of getting further information, can the doctor move on to closed questions. However, leading questions (which imply an answer) should be avoided at all costs as it could lead to misreporting. It is the authors' observation that in some instances, FME's tend not to use open ended questions. This is however understandable as indeed it is a skill to use these questions. Hence, training programs for FME should necessarily involve training in such questioning styles.

Listening actively is a core communication skill essential for history taking. It is a skill not easy to acquire. Active listening entails not only listening per se but also linking the information obtained to the theoretical/experiential information the FME already has. Hence, it is an active and involved process, requiring mental energy. An active listener allows victims to talk without interruption. Many doctors have the habit of disturbing their patients – studies reports that it could be even within 18 seconds of commencing the history[4] This will break the trend in the story the victim is narrating. One reason given for some interruptions may be the time pressure imposed on the doctor or else the attitude that what the victim is saying is of no significance. It is important to acknowledge to oneself if one has these tendencies and to rectify them. Doctors also display certain "blocking behaviors" which may make the victim withhold key information. Two examples of these behaviors are offering advice/reassurance before the main problems have been identified and switching the topic[5]. Doctors may display blocking behavior because of many reasons – for instance, when they feel uncomfortable by seeing a patients' sadness or psychological pain. It is important to prevent these behaviors happening and instead to actively listen to what the patient says – a process easier said than done, however.

Facilitation is where the doctor helps the victim to talk as fully as possible about the incident. Phrases like "Yes, I understand, please go on" and non-verbal communication such as nodding, facilitates the interview. In fact, facilitation involves putting into action all aspects of effective verbal and non-verbal communication.

Training in effective communication skills for FMEs in the Sri Lankan context

The above communication skills are innate in some doctors. The good news for others is that they can be learnt, as long as one has the motivation to do so. In most medical schools, it is now a component of the undergraduate curriculum that students are taught generic effective communication skills. Skills geared towards child sexual assault victim examinations per se can be imparted during the undergraduate forensic medicine attachment. However, since communication skills do not reliably improve from mere one-time experience[4], training has to be repeated at regular intervals even after graduation. Hence, the curriculum for the specialization in Forensic Medicine should introduce mandatory communication skills training, as in some parts of the world[4,6]. This should mostly be with the use of videotape/audiotape reviews, role plays and standardized patients which have been proved as effective tools[4], rather than through mere lectures. Another important factor that appears to contribute to students learning effective communication skills is the existence of role models within the clinical set-up. Hence, it is not only training but also the existence of senior clinicians, embodying these skills that lead to the effective internalization of these skills.

Further, studies indicate that doctors who felt insufficiently trained in communication skills are more likely to suffer from burnout[7], indicating that communication skills training will be of benefit to the doctor too.

The above positive interactions between the FME and the child victim will facilitate gathering of forensic evidence, considerably reduce child morbidity, result in better victim compliance and healing and prevent burnout for the doctor. Therefore FMEs should view communication skills training as a lifelong training for their benefit and for the child victims' benefit.

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PROBATIVE VALUE OF MEDICAL EVIDENCE TOWARDS ESTABLISHING ULTIMATE PROBANDUM AND PENULTIMATE PROBANDA IN A COURT ROOM.

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This article attempts to re-emphasize the probative value of medical evidence especially in a criminal court of adversarial nature, towards establishing the ultimate probandum. Further it is intended in this paper to identify a few issues pertaining to the effective use of medical evidence in the Sri Lankan judicial system for this purpose (in proof of a probandum) and propose remedial alternatives with an intention to constructively improve the system.

The main object and purpose of a criminal legal proceeding in Sri Lanka is to establish the propositions of the prosecution beyond a reasonable doubt in an attempt to administer justice. In this process, evidence is presented in form of physical or as testimony of witnesses. The accused who is presumed to be innocent until proven otherwise is provided opportunity in the law to defend himself against postulated propositions through, inter alia, rebuttal, denial, rival counter explanation, or using a legal defense argument.

In the court room, when the evidence is presented it is assumed and reasonably expected to analyze the evidence in terms of factual or material connotations (factual analysis) as well as performing a legal analysis. The common methods of legal reasoning used are inductive, deductive, abductive approaches or a combination. Very commonly logic is used in proving or disproving a proposition. A thorough understanding of logical reasoning and their limits are fundamental legal skills. Further, understanding the nature and application of law, articulation of facts, law and precedence, problem solving skills, appreciating and formulating arguments, coherence, making rational inferences are key components in proof of an ultimate probanda.

In proof of propositions and material facts, Wigmore has proposed a chart method[1] and construction of a key list which can be used in solving a criminal issue. This approach has been accepted to be logical, rational, coherent and allow inferences to be made effectively, if properly constructed. Rationalist tradition prevails in the anglo-american tradition of proof. It is reflected in the English law based legal system in Sri Lanka and unarguably in the western medico-legal practice. In this tradition, the inferential characteristics are relevance, credibility and probative force of evidence.

For a prosecution attorney, in order to establish his case a key list and a probable proposition chart is relevant. Analyzing all relevant propositions and hypothesis, the prosecution attorney can design their lines of arguments and the by which he would present his evidence. Similarly the defense can form their key list, proposition chart in order to establish the position of the defense.

Medical evidence can play a pivotal role in a criminal case. They can be used to either establish or reject a hypothesis or a proposition in a legal chart. It is up to the legal expert concerned to utilize and apply factual medical evidence and medical opinions to establish or nullify postulated hypotheses in order to ultimately reach its ultimate probandum. The probative values of medical evidence can be different depending on the case. In some legal cases medical evidence may not be used at all to establish or nullify penultimate probanda or ultimate probanda. The use of probative value of medical evidence can vary depending on the context of the case as well as on the experience of the lawyer. One lawyer may utilize medical evidence with a high probative value supported by other evidence while another lawyer may not use medical evidence for his propositions.

One main issue legal experts face is their lack of understanding of medicine. On the other hand medical practitioners having inadequate understanding of the law and legal requirement may produce evidence in such a way that the legal expert will be reluctant to utilize but depend on other available evidence to achieve legal aims which makes medical evidence redundant.

The law schools in Sri Lanka do not teach an essential component in evidence law which is "proof". Therefore the young lawyers have to rely on their seniors to learn aspects of "proof" through apprenticeship. The senior lawyers and judges too

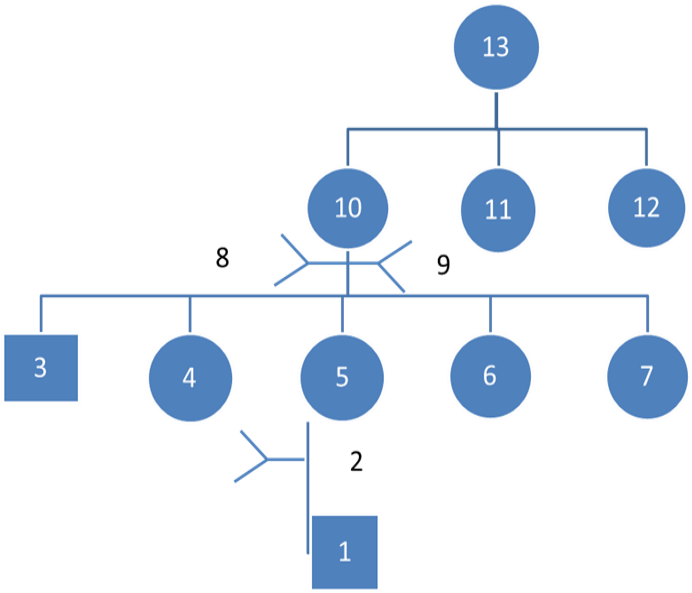
learn important aspects of proof and logics that are required for legal reasoning through continuous education, experience and law research. It may be pertinent that the Sri Lankan Law schools attempt to introduce "proof" component in evidence law which will benefit not only the lawyer and the judge but also the society and the system as a whole. Similarly the forensic training in Sri Lanka too does not involve formal theoretical teaching of "proof" and logic part which is an essential component in establishing the relevant scientific hypothesis concerning the 'death' or 'injury'. The experts learn it through experience, peer learning and learning through apprenticeship. It would have been better if both fraternities are formally taught about principles of proof that applies to science (for scientists) and to legal reasoning (for lawyers) so that their work becomes more logical coherent and outcome based. Forensic practitioners be it pathologists, anthropologists, odontologists or forensic scientists in their day to day work engage in proof of a generated hypothesis. Therefore not only in the work of a court of law but also in the work of a forensic expert, foundations of logic and principles of proof are relevant.

Taking an example outlined below, it can be illustrated as to how useful the principles of proof is to court as well as in a forensic investigation. I will be using a "Wigmore chart method"[1] supported by an already established key list to illustrate as to how proof of a proposition can be established for practical purposes. In a hypothetical case where Perera is charged with rape of Rani, the ultimate probandum in accordance to our penal law would be that " Perera raped Rani on 01.01.2012 around 9 pm." The material facts and the penultimate probanda would be that "perera had vaginal sexual intercourse with Rani on 01.01.2012 around 9 pm, there was a penile penetration and that this sexual intercourse in question occurred without the consent of Rani.

In establishing the hypothesis that there was vaginal intercourse two types of evidence can be useful. One would be scientific evidence and the other would be testimonies of the victim or witnesses. Those statements and certain behaviors of Rani, subsequent to the alleged incident can be taken into account as long as they are admissible without prejudice to hearsay or relevance. One of the prime scientific evidence of vaginal penetration would be vaginal injuries including hymenal injuries. The hypotheses such as "there are no vaginal injuries" and " that the injuries can be caused by methods other than penile penetration" or that "the injuries are not compatible with the alleged time or history" or that they are self inflicted and fabricated" can be brought up as defenses or rival explanations. These postulations can reduce the probative value of each piece of evidence in this case the presence or absence of vaginal injuries but will not nullify/negate the material fact totally. On the other hand the presence of semen in the vagina in the first instance is reliable evidence of a sexual act. However the propositions that semen can enter vagina via ways other than by penile penetration such as manual deposition, foreplay etc are relevant propositions. However the presence of Perera's DNA in the isolated semen in the vaginal swab from Rani will provide a strong correlation between Perara's involvement with Rani sexually. However this will not establish non consensual vaginal intercourse beyond a doubt although this evidence is with a high degree of probative value. In proof of "non consent" other evidence such as evidence of violence, pattern of injuries, eye witnesses, testamentary of victims are relevant to make alternative or supportive probanda. Establishing Perera's alibi is an important defense.

The establishment of "rape" in legal sense is multi factorial and will have to establish all penultimate probanda beyond a doubt (using intermediate probanda) in order to establish the ultimate probanda beyond a reasonable doubt to succeed.

This illustration helps to understand the use of Wigmorian approach[2] both to establish a medical hypothesis in the forensic laboratory as well as to establish a legal hypothesis in a court of law. Part of a Basic Wigmore chart is below to illustrate the proof of ultimate and penultimate probanda in relation to the above illustration.



1. A testimony of a witness who heard Rani cry for help
2. Rani had a money dispute with Perera
3. Rani's statement
4. Presence of male pubic hair in Rani's genital area.
5. DNA isolated from Rani's vaginal swab
6. Recent injuries to Rani's hymen and vaginal tract
7. DNA isolated from Rani's vaginal swab belongs to Perera
8. Perera had a sexual relationship with Rani for some time
9. Perera was visiting a patient in a far away hospital on 01.01.2012 evening.
10. Perera had a sexual intercourse with Rani on 01.01.2012 at around 9 pm
11. Perera's penis penetrated into Rani's vagina
12. The intercourse Perera had with Rani on 01.01.2012 at around 9 pm is without her consent
13. Perera committed the offense of rape.

It must be noted that this is a very basic presentation of a Wigmorian chart merely for illustration purposes. There can be several different interconnected segments with intermediate probanda and items of evidence connecting to material facts and then to penultimate probanda in a Wigmore chart in a real case scenario with propositions for and against prosecution which[3] can look complex but provides a logical coherent line of argument in order to prove the position of the prosecution or the defense.

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LIFE INSURANCE POLICY: IS IT AN INDICATION FOR INQUEST?

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INTRODUCTION

According to the Code of Criminal Procedure act, an inquest is done to find out the cause and circumstances of death in cases of suicide, deaths caused by animal, machinery or an accident, sudden death or when the cause is not known, and deaths in custody,etc... Sometimes medico-legal autopsy is needed for the further confirmation of the cause of death. However author experiences medico-legal investigation with ancillary investigations is an essential part in some instances, including claiming insurance which is not an indication in death investigation in current practise[1]. This case report highlights the importance of an inquest and medico-legal autopsy to fulfill the area which needs the relatives of the deceased in claiming the life insurance and it would become a great benefit for both parties, the client and the insurance company.

Case Report

Apparently healthy young male of 22 years, a 2nd year student in a technical college suddenly developed shortness of breath following his lunch and then he lost his consciousness. Immediately he was taken to the hospital. Resuscitation was unsuccessful and probable cause of death was given as ischeamic heart disease according to the electrocardiogram findings by the attending medical officer at the outpatient department and an inquest was requested. Inquirer into sudden death (ISD) requested for a medico-legal autopsy in further confirmation of cause of death. He did not have any history of asthma, cardiac diseases or any allergies in his past medical history. He did not have a family history of unexplained deaths. However he was a smoker, 10-20 cigarettes daily for about 2-3 years and consumed alcohol occasionally. In general examination, deceased was moderately obese and height was 160cm. Even after subcutaneous and muscular-skeletal dissections, no injuries were detected. Internal examination, heart was 225g and showed proximal 1/3 of the right coronary artery was 75% narrowed, eccentrically with atherosclerosis and mild to moderate atherosclerosis was seen in left coronary artery. Myocardium, endocardium and valves were normal. In the stomach, partially digested food was present and there was no smell of alcohol or poison. Other system examinations were macroscopically normal. Histological examination was normal including the myocardium and only mild pulmonary oedema was seen. Toxicology including alcohol and microbiological investigations were normal. Finally the cause of death was given as coronary artery disease. The verdict was given as natural circumstances by the ISD.

As known later the deceased had a life insurance policy which was only 3 months duration and insurance company refused to release the full payment as the issues raised whether the relatives knew that the deceased was having a heart disease beforehand. Then the next of kin went to district courts to get the payment and there the issues were raised, whether the circumstances of death was natural or known previously. Also insurance company needed to know whether violence and poisons were excluded as other possible causes of death.

As the medico-legal autopsy with histology and laboratory investigations had been performed to confirm the cause of death and to exclude other possible causes, medico-legal evidence was strong enough to confirm that a previously healthy young man can have an unexpected death due to 75% narrowing of coronary vessels and parents of the deceased were able to claim for the insurance.

DISCUSSION

Generally an inquest is performed for all sudden deaths. If suspicions are not raised during the inquest regarding the probable cause of death, ISD may not request for an autopsy. When the relatives of the deceased try to claim for the life insurance, controversial issues regarding the cause of death may be raised and there the clinical diagnosis may be challenged if it is not confirmed by a medico-legal autopsy[2,3]. Even if the post-mortem examiantion confirms the cause of death, as in above case, issues may be raised regarding intoxication where the laboratory investigations will help the final decision regarding the cause of

death. Even though in the present Criminal Court Procedure, insurance issues are not a pre requisite for performing an inquest with subsequent autopsy, it is very important to conduct an autopsy with ancillary investigations including histological and toxicological investigations which are really helpful in giving a complete cause of death. This will help in solving issues raised by the insurance companies. It also plays a vital role in excluding other causes of death in a case like above, where the death due to coronary artery disease is rare, but identified cause in a young male of 22 years [4, 7, 9, 10, 11]. However it is disclosed that a person with 75% occluded coronary vessels, specially eccentric narrowing may remain asymptomatic and at the same time it can lead in to a sudden death [5, 6, 8, 11]. In a sudden death of an individual with a life insurance policy, it is worth to conduct an inquest and medico-legal autopsy as it is impossible to challenge the cause of death by the insurance company against such scientific evidence. On the other hand it will prevent insurance companies from paying unnecessary claims.

CONCLUSION

This case highlights the importance of an inquest, medico-legal autopsy and medical opinion in cases of life insurance claims, which benefits both parties.

SUGGESTION

We suggest that inquest should be requested in cases of death of a person having a life insurance policy. Amendments to criminal code procedure can be considered with further case analysis.

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AN EVIDENCE BASED APPROACH TO CURRICULUM DEVELOPMENT IN FORENSIC MEDICINE
— POINT OF VIEW —

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In recent years, educational institutions around the world have been increasingly confronted with the challenge of making curricula relevant to the needs of the time with regular up-dating in terms of actual necessity[1]. Financial constraints and increasing accountability for the use of public funds further highlights the need for universities to clarify their goals based on concrete data.

Undergraduate medical curricula cannot include all major specialties and the criteria for including content into the undergraduate curricula should not be based purely on the enthusiasm of teachers. It is clear that the more common strategy of offering a course in the hope that at some future time it may serve the physician graduate is not satisfactory. Thus, what should be taught at undergraduate level should be based on the needs and expectations of society from medical graduates. Rapid changes in medical information technology and the growth of government and patient influences (satisfaction rates, legal rights, etc.) should be factors which direct the behaviour of a medical professional and should be reflected in the content of medical programs. Since the requirements of patients, society and peers make a professional career much more complex now than it has been in the past, it emphasizes the need for medical curricula to be focused on outcomes supported by a strong foundation of educational theory and research. It is therefore necessary to develop an evidence based approach to making decisions on the content that is to be included in undergraduate curricula.

The importance of determining what needs to be included in curricula is clearly illustrated in the statement "effective teaching can be more dangerous than no teaching at all if it is not really relevant"[2]. One way of determining what needs to be taught to students is to rely on the judgments of experts to determine what a neophyte in the profession ought to know and ought to be able to do. However, reliance on expert opinion per se to determine educational goals result in "curricula being crammed with an ever burgeoning quantity of new and highly specialized knowledge…."[3]. Alternately gathering evidence about what a competent medical officer needs to know and needs to be able to do by feedback from stakeholders, critical incident technique, task analysis or by epidemiological studies would render more relevant scientific evidence regarding curriculum development.

Over the past few decades, the emphasis in medical education has been on methods of teaching, learning and assessment and on instructional strategies and tactics. More recently, attention has shifted to some extent from an emphasis on the education process to a consideration of the product and the expected learning outcomes. In short it is now appropriate to ask ourselves the questions "What sort of doctor are we trying to train? Have the needs and expectations of the society in which they will be practicing been taken into consideration?" [3]. These questions become even more relevant in the field of forensic medicine where the extent, duration and pure existence of a forensic medicine training program in undergraduate medical curricula have now become controversial. In the Sri Lankan context, while some feel that Forensic Medicine should be a postgraduate subject others justify its existence in undergraduate curricular based on the fact that all medical officers[*], on graduation, are expected to perform medico-legal duties[4,5,6,7]. The changing face of medico-legal practice in Sri Lanka is evident by the increase in the number of board certified medico-legal specialists/consultant judicial medical officers and by the introduction of short duration informal training programs for those medical officers who request such training. Therefore it may be assumed that the 'actual'

[*] PART V of the Medical Ordinance (1988). Available at http://www.saitm.edu.lk/fac_of_medicine/MED_files/MO_1988.pdf. Accessed on 10/07/2012

medico-legal requirements of a non-specialist medical officer are diminishing. However the fact that Forensic Medicine is not a popular branch of medicine for specialisation, lack of updating of the circular of the ministry of health and the informal nature of the short duration training programs make it necessary to ensure adequate undergraduate training in Forensic Medicine. Furthermore, the fact that Forensic medicine is not merely the conduct of autopsies or the examination of clinical medico-legal cases and that it encompasses many other aspects at the inter-phase of medicine and law (eg., certification of death, documentation, maintaining records, ethical behaviour), justifies the inclusion of Forensic medicine as an undergraduate subject in the medical program in Sri Lanka.

The ill-defined 'medico-legal role' of medical officers, concerns expressed by interested parties that; there is a reluctance and lack of confidence among medical graduates to perform medico-legal duties, dissatisfaction among stakeholders about the performance of medical officers and concerns that too much time in the undergraduate curriculum is being used for Forensic medicine highlights the necessity to define these so called professional competencies that should be aquired at the end of undergraduate medical education. These should be defined even in embryonic form with provision for further development during the course of their careers[8].

Review of Sri Lankan literature revealed that a discrepancy does exist between private sector employer needs and graduate skills of those passing out from the state universities[9]. Tharmaseelan (2007) noted that universities have a danger of offering programs that are not relevant or do not match the needs or demands of the work world[10]. Subjects are introduced without prior consideration of future markets, review of needs or long term vision but merely because there are specialists in a subject area in the department who have an interest to promote their own favourite subject. However no studies have been published with reference to state sector graduate competencies and the state sector employer needs of Sri Lanka. It appears that there is a presumption that since the supply and demand are both related to the state sector that a needs analysis is irrelevant. The high expectations of the medico-legal system in Sri Lanka from a medical officer who has limited training in medico-legal work (purely undergraduate) lead to the hypothesis that a gap exists between stakeholder expectations and graduate competencies with regard to medico-legal work.

It is seen that Forensic Medicine training at undergraduate level is not based on a *formal process* of needs assessment. It is not linked to the key priorities of the the ministry of justice which in turn should be communicated to the ministry of health and the ministry of higher education. In short there is a fairly loose relationship between the service provider (ministry of health), service recipient and the pre-service training institutions (ministry of higher education) which is not used in any formal way for workforce training and development[11]. Unless this task is approached thoughtfully and systematically the curriculum would merely be a reflection of faculty interest rather than of stakeholder, student or public needs.

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