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EDITORIAL

RESEARCH AND SCIENTIFIC PUBLICATIONS : SOME ETHICAL CONSIDERATIONS

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Research approaches and methods are multi fold. Whether it is qualitative, quantitative or mixed methods, research attempts to generate new knowledge. In sciences, it attempts to provide answers to unanswered research questions based on an accepted approach. It is imperative that such findings of answers to those questions are disseminated to relevant audiences for education, generate applications of the discovery or to scrutinise scientific validity of both the approach or the answer. Therefore, in sciences conducting research and their publications in scientific literature are significant.

This communication identifies key ethical considerations in scientific publications. The intention of highlighting these nuances is to appreciate their relevance to maintain quality of publications while maintaining ethical standards and professionalism. Many appear to recall that there are such ethical considerations yet find it difficult at times to articulate and posture them in context.

Most research is collaborative work. The outcome of such research is the collaborative efforts. At many instances, there have been disputes in naming authors and their sequence of appearance in the paper. It is important that the research team leader or the principle investigator of the research, identify this issue a-priory and determine potential collaborators, discuss with them their contribution and agree with what each contributor's role is and their position in any publication that may arise out of the research.

Appearing one's name in a paper indicates responsibility accountability and award of credit for personal contribution. The authorship and their order of appearance should under all circumstances need to reflect the order of honest weighted contributions by each author. Having an authorship in a paper has numerous benefits to the author and his/her affiliation.

Some institutions and journals have given directions as to how authorship is given and its order of importance. However these guidelines seem to vary and changing. In contrast, some junior researchers may add senior researchers even in the absence of any input with the hope of the paper being published or to secure junior's tenure, grants or other perks. Alternatively, the senior researchers may also indicate directly or indirectly that their names are included in papers published even in the absence or minimal contribution to the work reported, to falsely illustrate their research potentiality and participation which otherwise may not be reflected due to their engagement in administrative or policy level tasks. Further, junior researchers are inclined to satisfy the senior staff by including names of seniors, as the senior colleagues in a department can make things 'difficult' for the research or the person. These hidden intricacies require careful examination and address.

The order of authorship, how it should appear in a paper, vary depending on the discipline or setting. Generally, the descending order of contribution, placing the person who took the lead in writing the manuscript or doing the research first and the most experienced

contributor last is commonly used. However, placing researchers in alphabetical order or random order has also been seen. In any case it is important that;

1. all authors whose name are in, read and review the manuscript and accept order of authorship and sign for approval of the work to be published.
2. all contributors listed have made a substantial contribution to the work presented
3. all significant contributors to the work presented are listed as authors
4. that there are no honorary or 'guest authors'

The next point that requires consideration is whether or not the paper submitted for publication is original and has not been published elsewhere. Then the authors take responsibility of the contents of the paper. The authors generally need to declare that it is not presently under consideration for publication by any other journal. The corresponding author must declare if the work presented in the manuscript have been presented as an oral presentation or as a poster presentation.

Most journals request for an ethical clearance certificate. This implies that the journals or publishers are concerned that the work carried out is conducted giving emphasis to ethical standards and ethical considerations. Further, the authors should refrain from any form of plagiarism or coping that can be now detected easily through certain software that have been developed. In any case it is the responsibility of the authors that they present original work with no plagiarism. Previous work that is used to argue or explain in the manuscript should have been duly referenced /cited and permissions obtained where relevant.

When a manuscript is submitted to a journal it is assumed that the work has been conducted under strict scientific validity. The peer reviewing process attempts to audit scientific methods and validity, however, it is the responsibility of the researcher to maintain quality and standards of science at all times.

It is important that the authors notify the editors of the journal in which it is published ,any pre or post legal or administrative consequence that result on the research presented, so that the editorial board can decide on the fate of the paper in concurrence with the author/s.

Above are a few key ethical considerations I have highlighted. It is not only the scientific method that matters in research, but authorship, how the research is conducted and how it is presented to an audience too matters.

LYING TO PATIENTS: ETHICAL DILEMMAS OF COMMUNICATION IN PAEDIATRIC PRACTICE

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ABSTRACT

Doctors resort to conceal information or even to give partially wrong information with the intention of safeguarding patient's benefit. This stand is not acceptable for medical ethicists. However not divulging the entire truth has been seemingly beneficial in three case scenarios presented in this paper. Three case scenarios involve avoiding investigating a possible paternity dispute, giving false information to pursue on a low cost drug regimen, and not promoting legal action against serious therapeutic misadventure. These case scenarios were evaluated based on the definition of deception in Buddhist teaching. Accordingly, lack of intention to harm and lack of harm caused by the deception allow room for an argument that non-disclosure or partially incorrect disclosure is not a sin and therefore acceptable. However accepting lack of harm or even the benefit as an excuse for deception as a policy in a wider context of clinical practice needs careful consideration.

INTRODUCTION

Doctors have the privilege of entering the inner worlds of people and gathering information pertaining to the medical problems that they have been consulted, irrespective of whether such is related or unrelated to the malady of the patient. This information is gathered by verbal communication or investigations. The knowledge and experiences that they have embraced demands them to engage constantly in scientific interpretation of the information received. Information available to doctors is not always essentially beneficial to the patient, family and society. In fact they can be beneficial to some but not to others and sometimes may not be beneficial to everybody. In such situations, doctors have to face the dilemma of deciding what to and what not to divulge. Finally, this raises the question of whether doctors have to tell the truth and nothing but the truth.

In this recollection of three case histories the author shares his personal experiences of lying in different situations.

Case – 01

Baby K (2 years) was diagnosed as beta thalassemia major at the age of 8 months. Having confirmed the diagnosis by HPLC, a life long journey of regular blood transfusions was commenced. The child was brought to the ward once a month and given a blood transfusion to maintain his haemoglobin level at 9.5 g/dl. Both parents who were initially distressed had gradually adapted to the routine of coming to the hospital for blood transfusions. The mother is a housewife educated up to Advanced Level and the father is a technical officer working in Colombo.

The case was discussed during the routine ward round conducted by a team consist of a consultant, registrar, senior house officer, intern house officer , fourteen final year medical students and a nurse. The registrar took the lead role in presenting cases.

The diagnosis of baby K was confirmed as beta thalassemia major at the age of nine

months. Since then regular blood transfusion has been commenced. After the 10th transfusion he will have to take one tablet of Deferasirox daily to remove already accumulated iron from the body and he will have to continue this treatment forever in his life. So far there had been no problem with the management of this patient with regards to compliance or side effects. However, in this case the father has not been a thalassemia carrier and that raised a concern regarding the diagnosis as in case of a child with thalassemia major both parents should invariably be thalassemia carriers. Only exception would be a situation of a new mutation. The discussion in the ward round led to consideration of genetic testing to evaluate for genetic mutations in the child and repeating blood tests regarding father's thalassemia status. At this stage the group started making comments about DNA testing for paternity as one of the option in the process of evaluation.

At this stage the author curtailed the theoretically rational discussion and inquired about blood transfusion and other aspects of care to the child ignoring all the suggestion for further evaluation.

Case – 02

Miss B (10 years) was brought to the outpatient clinic room by her father and mother. The father had to carry this quadriplegic bed ridden child with cerebral palsy who is obviously too heavy for the mother to carry. Father sat on the small chair in front of me with the child on his lap, glancing at my face asking, "Do you remember me" The mother kept the medical records in front of me. I could not remember them. I pretended to remember, returned a smile and started turning pages in the record book.

According to the records, the child has survived an episode of encephalitis but was left with severe quadriplegia at the age of 3 years. After the initial care they moved to another city and consulted a number of specialists and a diagnosis of Lennox – Gastaut syndrome was established. She has been on four antiepileptic drugs (Vigabatrin, Clonazepam, Clobazam, Topiramate) for the past 5 years. I was impressed by the comprehensive care that had been offered to this child. After reading the book, I was holding the hands of the baby and while stroking the head asked from the parents what the author can do to help.

The mother explained her difficulties. Spending more than 35,000/= per month has not been an easy task. However, in spite the expensive treatment the child seems to be getting frequent convulsions. Therefore, the mother requested giving the same drug that was given to the child at the onset of the illness.

I noticed that we had used phenytoin immediately after encephalitis and continued the same for about two years. Subsequently phenytoin had been stopped and newer and more effective drugs had been initiated. At this stage options left were to start phenytoin sodium or to redirect the mother to neurologists with a referral letter explaining mother's concerns.

The author decided to use phenytoin sodium without further consultations and explained possible risks and adverse effects. Mother was not worried about the possibilities of the failure in the treatment but express major concerns when the well-known complications of phenytoin such as gum hypertrophy, excess growth of hair and facial disfiguration was discussed. Mother expressed reluctance to start phenytoin. However at this stage the author continued explaining possible advantages of starting phenytoin and how those advantages could overweigh the adverse outcomes like facial disfiguration and finally managed to convince the mother on the trail of using phenytoin sodium.

Case – 03

This case is about a prematurely born (34 week) low birth weight (1800 g) baby in a special baby care unit. On the 10th day of life a nurse had severed the 5th finger of this tiny baby's left hand by accident. When the author arrived at the ward the nurse was visibly emotionally distressed. Emergency care has been provided.

The author planned to break this bad news carefully. Communication skills with regards to arranging the environment, building rapport and exploring the parent's perceptions were followed by the actual breaking news. The reaction as expected was overwhelming and a little short of being physical. My silence and acceptance of their emotions were good enough to manage the situation. This episode was followed up with several discussions with parents and their relatives. The possibilities of legal action were discussed. I disclosed the possible mechanism of getting hospital records and more importantly the fact that the care for the child will not be affected as a result of legal action. However after much contemplation they did not proceed to a legal battle.

DISCUSSION

Doctors are supposed to "tell the truth and nothing but the truth". The American Medical Association's Principles of Medical Ethics take a step further and states that not only will a physician ' be honest in all professional interactions' but also promote reporting of physicians engaging in deception to the appropriate entities[1].

All three case scenarios demonstrate varying degrees of lying and breach of professional conduct.

Case – 01

The consultant is trying to hide the paternity issue and cover it up with possibilities of genetic mutation, sacrificing the truth for the harmony of the family that will be crucial for the child's life. However what about the father's right to know, and the child's right to know?

Case – 02

The consultant was lying to the patient regarding side effects of phenytoin and violating the code of professional conduct by not communicating with a colleague who had been looking after this child. Reflecting on the situation, I feel that I did not want any obstacle to my idea of trying phenytoin on this child entirely because of the presumed benefits that would accrue to the child according to my perception.

Case – 03

Severing of a body part is a grievous injury according to panel cord that warrants major punishment. However this case ended up in a departmental inquiry resulting in warning and transfer of the nursing officer to another unit. However I am not sure whether I had done the justice by settling emotions of the parents after the little finger of their little boy was severed. Here I never lied as far as facts are concerned. I never discouraged legal action. Probably I developed genuine relationships and harnessed empathy towards the nurse. Do I have a duty to encourage and promote legal actions in a case like this? I have divulged correct facts, but have communicated correct emotions and correct moral values that are essential components of communication. According to the directive of the American Medical Association there is duty to promote reporting such cases.

Lying is considered a sin in almost all religions. It is the forth out of the five precepts in Buddhism. According to Theravada Buddhism violation of fourth precept constitutes four elements. Firstly there should be a situation to lie about, secondly there should be an intention to deceive, and thirdly there should be an expression of false information by words, gestures or body language. Finally

conveying a false impression should be completed[2,3,4]. This definition highlights that there should be an intention to deceive. I was trying to find relief in this definition as I did not have intention to deceive. I am sure the readers have the right to ask the question. Are you sure?

Concealment of information for the therapeutic advantage on the basis of the Hippocratic dictum *"primum non nocere"(first do no harm)* has been challenged as a valid excuse. In fact some courts have rejected this argument[5]. Patients autonomy and obligation of loyalty demand truth telling. Patient contract with the doctor would be breached leading to mistrust if the doctor fails to provide all relevant information to the patient. Patients know how to manage information available to them[5].

The second case deals with providing palliative care. Providing palliative care for children with incurable disease should have a multidisciplinary approach to relieve pain and symptoms while attending to emotional and spiritual needs of the child as well as the family. This should be appropriate to the society and the culture with the involvement of the primary care doctor[6]. Taking over patient care on the patient's request is not an unusual practice in our country. This is commonly happening during the private practice rather than the hospital practice. However this patient requested to take over the care in the hospital clinic. Whether acceptance of a patient without a referral deserves to consider as a breach of professional conduct is dubious. Offering a drug like phenytoin that has been given up due to known side effects like severe gum hypertrophy could be considered as deceiving the patient, specially when the side effects were only partially revealed. The only excuse is probably the benefit of the family.

The honesty although desirable may not be the best always. The duty to tell the truth is not absolute and can be balanced against the advantages and disadvantages. In fact the doctors have no duty to disclose all the information unless it is relevant[7]. The blood tests done in the first case was not done with the intention of testing paternity. Therefore doctors have no duty to disclose[7]. As the purpose of the test[7] was not testing paternity in fact it will be unethical to divulge this information without consent[7]. However Zen Buddhist teacher Reb Anderson suggests that we distinguish between what is harmful and what is hurtful. "Sometimes people tell you the truth and it hurts a lot, but it is very helpful,"[3] GMC elaborates the need for being honest and truthful always[8].

CONCLUSIONS

The prime need of being respectful and supportive to our patients is essential. To what extent we should strictly adhere to total disclosure of information should be decided base on the circumstances of the case. The Buddhist disclosure on right speech (sammavacha) proposes the following criteria for deciding what is worth saying; is what is disclosed factually true, is it the correct time to divulge, is the receiver ready to listen and is the message beneficial and delivered in a calm manner. I consider this is a worthy guide for doctors.

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WHERE IS THE LEGAL CONCEPT OF "INJURIES LIKELY TO CAUSE DEATH" FOUND IN SRILANKAN "MEDICO-LEGAL CLASSIFICATION OF INJURIES"

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ABSTRACT

Forensic medical practitioners (FMP) recognize different types of injuries according to severity as non-grievous, grievous endangering life, fatal in ordinary cause of nature and necessarily fatal.

Legal concepts about severity of injuries are found in following sections of Penal Code of Sri Lanka-Non grievous hurt in Section 310, Grievous hurt in Section 311. , Fatal in the ordinary cause of nature in Section 294-(third)., Necessarily fatal in Section 294 (fourth).

"Injuries likely to cause death" is an important legal concept applied for the judgment of offences against human life. But FMP do not recognize, academically discuss or research this topic because it is not directly mentioned in medicolegal examination form or medicolegal report as a category of medico-legal classification of injuries.

This concept seems to be included in the category of "endangering life" under limb 'h' of grievous hurt and need careful consideration for correct recognition by doctors, police and judiciary.

"Endangering life" category includes existing clinical conditions which may cause death such as-

1. Already developed rare fatal complication
2. Injuries which has significant possibility of death 40- 50%.
3. Injuries which has a probability of death (more than 50% chance of death or injuries likely to cause death).

Till legal amendments are done to in cooperate "injury likely to cause death" in to medico-legal examination form and medico-legal report, forensic medicine practitioners should be informed to explain the basis for categorizing the injury under "endangering life" as one of above three reasons.

Full paper

Introduction- "injuries likely to cause death" is an important legal concept applied for the judgment of offences against human life. But Sri Lankan forensic medicine practitioners do not discuss this topic because it is not mentioned in any category of medico-legal classification of injuries of Sri Lanka. This concept appears to be included in the category of "endangering life" and need careful consideration for correct recognition by doctors, police and judiciary.

Medico-legal classification of injuries

At the end of the medicolegal examinations Forensic Medical Practitioner (FMP) is supposed to classify injuries according to severity under the headings of Non grievous hurt, Grievous hurt, Endangering Life and Fatal in the Ordinary Cause of Nature.

Doctors do not classify injuries under the section of "Injuries Likely to Cause Death" (ILCD), since they are not expected to do so.

Therefore there have not been any medico-legal academic discussions and significant scientific development regarding this category.

When we scrutinize the entire medicolegal classification of injuries, the group named "Injuries likely to cause death" is not found in anywhere but seems to be included in the "Endangering Life" section.

Medico-legal classification of injuries of Sri Lanka includes following categories.

1. Non grievous injuries- Section 310 of Chapter XVI of penal code[1] defines Hurt as "who ever causes bodily pain, diseases or infirmity to any person is said to cause Hurt" . Section 311 of penal code defines "grievous hurt". Any hurt does not fall within the definition of grievous hurt is considered a non-grievous hurt.

2. Grievous hurt- Section 311 or Chapter XVI of penal code defines "Grievous Hurt". It has nine limbs.
   (a) Emasculation
   (b) Permanent privation or impairment of the sight of either eye
   (c) Permanent privation or impairment of hearing of either ear
   (d) Privation of any member or Joint
   (e) Destruction of permanent impairment of the powers of any member or joint
   (f) Permanent disfiguration of head or face.
   (g) Cut or fracture of bone, cartilage or tooth or dislocation or subluxations of bone, joint or tooth.
   (h) Any injury which endangers life or inconsequence of which an operation involving the opening of the thoracic, abdominal or cranial cavity is performed.
   (I) Any injury which causes the sufferer to be in severe bodily pain or unable to follow his ordinary pursuits, for a period of twenty days either because of the injury or any operation necessitated by the injury.

3. Fatal in the ordinary cause of nature (FIOCN)- (Section 294- third)

4. Necessarily fatal- (Section 294-fourth)

Legal concept of severity of injuries

Legal concept about severity of injuries contains several groups including one group named "injuries likely to cause death".

Culpable homicide is defined in the Section 293 of the penal code as " the causing of death by doing an act with the intention of causing death or with the intention of causing such bodily *injuries as is likely to cause death* or with the knowledge that the doer is likely by such act to cause death". Here the word "likely" means probable. When the chances of a thing are greater than its not happening we say that the thing will "probably" happen. That means the chances are more than 50%[2]. Medicolegal classification of injuries does not have this category.

Section 294 of the Penal code states that "culpable homicide is Murder"

Firstly- if the act by which the death is caused is done with the intention of causing death.

Secondly- if it is done with the intention of causing such bodily injury as the offender knows to be *likely to cause the death* of the person.

Thirdly- if it is done with the intention of causing bodily injury to any person, and the bodily injury intended to be inflicted is sufficient in the ordinary cause of nature to cause death.

Fourthly- if the person committing the act knows that it is so imminently dangerous that it must in all probability cause death or such bodily injury as is likely to cause death and commits such act.

Comparison

Penal code section 294 states about –"bodily injury sufficient in the ordinary cause of nature to cause death". Medico-legal classification of injuries include the same concept as "injury fatal in the ordinary cause of Nature".

Penal code section 294 states about "Injury so imminently dangerous that it must in all probability cause death" Medico-legal classification of injuries include the same concept as "injury necessarily fatal".

Penal code sections 293 and 294 state "injuries likely to cause death". But medico-legal classification of injures does not have similar concept.

When carefully scrutinizing the medico-legal classification of injuries, it is apparent that "injuries likely to cause death" is not mentioned in any section. But under "Grievous Hurt" limb- (h) first part " any injury which endangers life" appears to deal with this legal concept. No other groups of medico-legal classification of injuries appear to deal with this legal concept.
What is meant by "injury endangering life" in medico-legal classification of injuries?

An injury is said to endanger life, when there is an existing threat to life by way of injury, organ damage, consequences like bleeding, shock or developing of complications like tetanus, septicemia, meningitis. In other words there is a fatal risk due to the injury/ damage or due to a complication that patient actually developed. Fatal threat to the life must be an existing threat/ real threat and not a potential threat/ suspecting threat[3].The existing threat may result in death.
There should be a significant probability of death. When the probability is very small like 5% -10% it is not considered as endangering life because it is only a possibility. If the "patient may die", it means there is a significant probability around 50%. When the probability is 25 % to 80% those injuries can be classified as "endangering life" conditions. Traditionally when the probability is more than 80% they are classified as FIOCN because doctors can predict that death will result if treatment is not given.

Different ways of injuries exhibit "existing threat to life"

FMPs recognize "existing threat to life" in various clinical situations such as vital organ damage, development of common complications and development of rare complications.

<u>Organ damage</u>

1. Damage to internal organs such as;
   A- Concussion of brain (transient loss of consciousness) following head injury – there is a risk of death due to asphyxia due to tongue fall backwards or aspiration of vomitus.

   B- Myocardial contusion- there is a risk of cardiac arrhythmia and sudden death.

   C- Small haemothorax or small pneumothorax requiring no surgical treatments but need conservative management such as close monitoring or keep under medical observations – there is a risk of developing these lesions further and causing respiratory difficulty.

   D- Damage to medium sized blood vessels like those below elbow and below knee- there is a risk of bleeding and developing shock. (When large blood vessels above elbow and above knee are damaged there is rapid bleeding and a very high chance of death due to hemorrhagic shock. Therefore those injuries will be classified as "Fatal in Ordinary Cause of Nature".)

Direct consequences of injuries

2. Due to hemorrhage and shock– Shock indicates low blood supply to body tissues. Clinically, a state of reversible shock with pulse over 100, systolic blood pressure below 100mmHg, sweating and cold, clammy extremities is classified as endangering life.

3. Acute renal failure following blunt trauma to skin- after multiple contusions when acute renal failure (low urine output) is developed there is a significant chance of death.

Rare complications

4. Rare complications arising as a direct result of injury as severe infection (meningitis, peritonitis, tetanus).

5. Rare fat embolism after fractures and soft tissue damage.[4]

6. Rare pulmonary embolism after long bone fractures or immobilization for a long time due to injury.

Commencement of a common fatal complications after trauma but do not progress and do not require treatment.

7- After trauma if a fatal complication starts, careful supervision will be necessary for prompt intervention. But the fatal complication naturally stops without progressing. During the initial period life is in danger. Ex- small extradural hemorrhage develops after trauma to head managed conservatively with only close observation, no surgical treatment is required.

According to the medico-legal concept the threat to life must be an existing threat and not a potential threat. When there is a small abrasion it is not argued that the patient has a possibility of developing tetanus in future and there is a threat to life. Possibility of tetanus is not an existing threat. It is a rare complication, only a potential threat. But when patient actually develops tetanus after a small abrasion, it can be classified as endangering life because now there is an existing threat.

According to medico-legal concept, the existing threat should be a significant threat, but should not be a very severe threat. Injury only "may result in death" and not "will result in death"[3].

According to above medico-legal explanation, "endangering life" concept includes -Injuries may cause death (with a significant probability) by the direct consequences according to the usual course of nature and already developed rare complications outside of usual course of nature (extra ordinary complications). Significant probability may be around 50%. Less than 50% (20-49%) or more than 50% (51-80%) can be considered as "injuries likely to cause death".

Example – 01

A cut artery below elbow level may cause bleeding to death. There is a probability of death. Due to spasms of walls of blood vessels medically we can expect spontaneous stoppage of bleeding and cannot expect death as a consequence of ordinary course of nature. Therefore cut injury of artery at below elbow is medico-legally classified as "endangering life".

Example – 02

A small hemothorax in a patient needs continuous medical supervision for surgical intervention if the condition worsens. But no urgent surgical treatment will be provided at the beginning. If a small hemothorax does not enlarge and it is managed without any surgical treatment and only with medical observation, it will be medico-legally classified as "endangering life". Because there was an existing danger to the life necessitated medical observation to monitor the progression.

Example – 03

A scratch of the hand may lead to the development of tetanus. Tetanus is a fatal illness. Now there is an existing danger to life. But tetanus is not a usual complication in the ordinary course of nature of a scratch of the hand. The ordinary course of the scratch of the hand is healing within few days. Tetanus is a rare complication, an unusual complication and an extraordinary consequence of an abrasion. If, by any chance, tetanus develops, then the scratch of the hand will be medico-legally classified as "endangering life". The probability of developing tetanus from a scratch is extremely low (less than 1%)[5].

When considering the above three examples of "endangering life" situations, number two and three will be punished under law of grievous hurt. Because both original injuries had only the possibility of death, very low chance of death and they are not injuries "likely to cause death". But example one has a probability of death. Significant chance of death around 50%. It is an injury likely to cause death. Therefore it can be punished under sections 294 and 294.

Defense counsels will argue that all three injuries amount to grievous hurt because "they were medico-legally classified as endangering life" and "endangering life is the limb-H of the grievous hurt". That argument arises because there is no recognized portion of medico-legal classification similar to the concept of "injuries likely to cause death".

Problems in the present medico-legal practice

A- In real practice, forensic medical practitioners recognize following all injury groups as "endangering life" situations.
   1. Injury with a *probability* for death. Significant chance around 50%. It is equal for "injuries likely to cause death" - cut below elbow).
   2. Injury with a *possibility* of death. Less than 20% chance of death. Though some medico-legal practitioners may consider that the injury may result in death, it is not an injury "likely to cause death". Eg- small hemothorax which does not enlarge.
   3. Injury that is initially considered as simple hurt but then develops a rare fatal complication. Because there is an existing danger to life due to already developed complication, the injury is classified under "endangering life". Eg- small scratch gives rise to tetanus.

Therefore "injuries likely to cause death" are also categorized under "endangering life" group with other injuries, which belong only to grievous hurt. Whenever a medicolegal examination form mentions about "endangering life" magistrate court will summon the doctor for a detailed Medicolegal report[6] (MLR) and decide whether the injury belongs to "grievous hurt" or "injury likely to cause death". For this stage medicolegal knowledge of forensic medicine practitioner is not utilized.

B- Some doctors do not mark "endangering life" cage in medico-legal report, but mark only "grievous hurt" cage. Their argument is "endangering life" is one limb of grievous hurt and it is not necessary to mark both cages. Then the police do not know whether the injury is a serious injury. If the FMP marks both grievous hurt and endangering life cages, then magistrate courts will summon the doctor for detailed MLR and decide the appropriate legal section to proceed.

C- Most importantly, the concept of "injury likely to cause death" is not academically discussed among doctors. Therefore no research has been conducted on this topic.

D- No research has been done and less or attention has been paid for the concept of "probability of death" in relation to injuries in Sri Lanka[7].

E- When evidence is lead in court trials forensic medicine practitioners face difficulties about explaining the "probability of death" and "injuries likely to cause death" in relation to the individual case because there is no prior preparation.

F- When the FMP marks " endangering life " cage, during the court trail the defense counsel will invariably ask whether this injury belongs to grievous hurt because endangering life is only one limb of grievous hurt. The FMP who knows that "endangering life" section includes different types of injuries explained above can clearly separate injuries classified as endangering life but only amount in to grievous hurt and injuries classified as endangering life but amount in to "likely to cause death".

CONCLUSIONS

"Injuries likely to cause" death is an important legal concept. Since it does not in the Sri Lankan medico-legal classification it should be included in medicolegal examination form and medicolegal report. The Sri Lankan medico-legal classification needs a separate section named "Injuries likely to cause death".

"Injuries likely to cause death" are classified under "endangering life" with other injury groups such as "injuries developed rare fatal complications". Till legal amendments are done to in cooperate "injury likely to cause death" in to medico-legal forms, forensic medical practitioners should be informed to write details in the remarks column about the reason for categorizing the injury under "endangering life". If the injury has a probability of death, it should be mentioned in the remarks column. Then at magistrate court level injuries categorized as "endangering life" can be easily separated in to "grievous" or "injuries likely to cause death".

Case studies and more researches should be conducted about the "probability of death" and "injuries likely to cause death" in Sri Lankan context. Then forensic medicine practitioners will be more prepared about these two concepts to help courts.

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RECONSTRUCTION OF HIT-AND-RUN VEHICLE TYPE BASED ON UN-COMMON RUN-OVER INJURIES

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ABSTRACT

The main objective of investigations in hit-and-run accidents is to trace the vehicle. This is a significant challenge when there is no eye witness. It is easy when vehicle is a car or heavy vehicle since it leaves expected injury patterns. Following case discussion is based on a body found roadside with un-common run-over injuries.

An unidentified body with injuries was found roadside in supine position. There were no eyewitnesses. Autopsy revealed three groups of injuries; crushed fractures in feet, crushed laceration over the pubic area with underlying major vessels damage, and superficial abrasions over knees. Distance from feet to knee injuries was 23 inches and to pelvic injuries 46 inches. Stomach had liquor smell.

Two areas of crushed injuries with almost injury free area in-between suggest run-over by two tires. The distance between two crush injuries was 4 feet and was compatible with rear wheels of a three-wheeler. Injuries over knees were not severe and were situated midway between two severe injuries and were compatible with front tire of three-wheeler. The deceased would have been in lying position probably under the influence of alcohol. However, there were no tire marks, paint or glass fragments etc for specific identification of the three wheeler.

Keywords: hit and run accident, un-common run-over injuries, reconstruction, three wheeler.

INTRODUCTION

Leaving the scene of a crash without reporting is called hit-and-run collisions. It is an offence in most countries[1] including Sri Lanka. Hit-and-run collision is a punishable offence as it delays crash notification thereby delaying emergency response which increases the likelihood of traffic fatality[2]. Therefore, hit-and-run crashes account for a significant proportion of pedestrian fatalities. Of the 48,000 pedestrian deaths that were recorded in the United States between 1998 and 2007, 18.1% were caused by hit-and-run crashes[3].

Many studies have been devoted to improve the ways and means to identify hit-and-run vehicles and the drivers involved. A study done in Singapore in 2008 found that drivers were more likely to run when crashes occurred at night, on a bridge and flyover, bend, straight road and near shop houses; involved two vehicles, two-wheel vehicles and vehicles from neighboring countries; and when the driver was a male, minority, and aged between 45 and 69[1]. On the other hand, collisions occurring on undivided roads were less likely to be hit-and-run crashes[1].

The main objective of the medico-legal investigations in hit-and-run accidents is to trace the vehicle. This is a significant challenge when there is no eye witness. It is easy when the vehicle is a car or heavy vehicle since it leaves expected injury patterns. Following case discussion is based on a body found roadside with un-common run-over injuries.

Case report

An unidentified body with injuries was found in the dawn, in a pool of blood at the roadside along a main road in front of a bus halt in supine position with the head directed towards the pavement. According to the investigating police officer, there were no eyewitnesses.

Autopsy revealed that the body was clad in a sarong and a long sleeved shirt and the clothes had dust and mud stains but no tire marks. There were no paint or glass fragments in the clothes and the body. There were three groups of injuries (Figure 1); transversely placed crushed lacerations and underlying fractures in feet (Figure 2), almost transversely placed elongated large crushed laceration over the pubic area of the pelvis with underlying major vessels damage including right femoral vessels. (Figure 3), and superficial abrasions over knees (Figure 4). Distance from feet to knee injuries was 23 inches and to pelvic injuries 46 inches.

Except for pallor, the remaining internal organs were unremarkable. Stomach had liquor smell but blood alcohol level was not available due to leakage of the sample while transporting to the laboratory or during storage at the Laboratory.

Cause of death was haemorrhagic shock due to major pelvic vessels damage due to blunt force trauma. Further, it was noted that the injury pattern was consisted with run-over injuries.

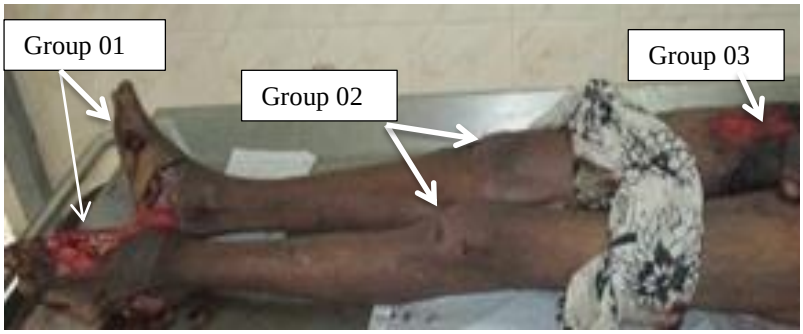

Figure 1: Three groups of injuries

Figure 2: Crushed feet

Figure 3: Crushed laceration over the pelvis

Figure 4: Superficial injuries on knees

DISCUSSION

Many pedestrians who are involved in road traffic accident die as a result of the driver leaving the pedestrian who is struck unattended at the scene of the accident[4]. Similar to scene of crime findings of this case, being a fatal accident, nighttime condition, and straight and flat road section significantly increase the likelihood that the vehicle driver would leave the scene after hitting a pedestrian[4].

There were no injuries or injury patterns that were compatible with 'primary impacts' such as bumper fractures, patterned injuries etc, 'secondary impacts' such as glass cuts etc or 'secondary injuries' such as grazed abrasions to suggest that the pedestrian was in standing or squatting position at the time of the impact.

Two areas of crush injuries placed transversely over feet and pelvis with almost injury free area in-between suggest run-over by two tires. Therefore, run over by a motor bike could be safely excluded.

The distance between the two crushed injuries was 4 feet and it suggests that the offending vehicle could be a less wide vehicle rather than a van or standard compact car where the width is usually about 5.6 feet[5]. The distance between the rear wheels of a standard three wheeler available in Sri Lanka is 4 feet.

Absence of underlying pelvic fractures or severe internal organ damages were more compatible with wheels of a light vehicle such as three-wheeler rather than a supermini, subcompact[5] or light car such as Maruti 800 where the width of wheels is about 4 and half feet (56 inches)[5].

Injuries over knees were not severe and were situated midway between the two severe injuries and were compatible with front tire of a three-wheeler. Less severe injuries by front tire could be due to less weight exerted on it.

Absence of injuries to suggest that the pedestrian was in standing or squatting position at the time of the impact, presence of liquor smell in stomach and presence of injuries compatible with run-over suggest that the deceased would have been in lying position probably under the influence of alcohol.

In run over, tire tread marks do not invariably occur, but if they do, it may be on the clothing and or on the skin[7]. In this case, except dust and mud stains, no tire marks were found in clothes and the clothes may have prevented tire marks on the skin too. The absence of injuries on the rest of the body should be due to the clearance space of the vehicle from floor and it is 9"-14" in a standard three-wheeler.

However, no paint or glass fragments on the body were found for further confirmation and specific identification of the vehicle.

Low speed vehicle run-over (LSVRO) incidents are those where a pedestrian, is injured or killed by a slow moving vehicle (less than 30 km/hr or 19 mph) in both traffic and non-traffic area[8]. Three-wheeler is a moderate speed vehicle and it also can cause low speed vehicle run-over (LSVRO) deaths.

Integrating median separation and speed humps into road design and construction and installing street lights will help to curb the problem of pedestrian hit-and-run accidents[4]. In addition, targeted traffic enforcement should be performed on weekends and nighttime[2]. However, the effects of road-related factors and harsher legal punishments have limited influence for reducing hit-and-run likelihood after a driver hits a pedestrian[9].

However, to initiate the prosecution procedures, the specific identification of the vehicle is a basic requirement. Therefore, the

reconstruction of the event in order to identify the vehicle in hit-and-run crashes by the forensic pathologist is highly important.

CONCLUSION

The injury pattern was compatible with run-over by a three-wheeler while victim in lying position. However, there was no autopsy evidence for the specific identification of the offending vehicle.

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A PROSPECTIVE STUDY ON CLINICAL FORENSIC CASES EXAMINED AT NORTH COLOMBO TEACHING HOSPITAL; NEW CHALLENGES FOR THE 21ST CENTURY

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ABSTRACT

The specific objective of the study is to do a quantitative analysis of forensically relevant clinical cases examined at North Colombo Teaching Hospital with a view of identifying lapses in the medico-legal management and suggest recommendations to improve the system. The data was collected by analyzing the completed Medico-legal Examination Forms (MLEF) and personal notes made by the examining doctor attached to Department of Forensic Medicine at the North Colombo Teaching Hospital. The study revealed that the majority of the victims were male (73.3%) and belong to the age group of 19-59 years (84%). The victims who were examined had sustained injuries mainly due to assaults and accidents. (71%) Wife battery amounted to 5.9% of the cases. A sound medico-legal service is important for the existence of a good criminal justice system. MLEF is an important tool to gather vital information. A modified MLEF, Forensic Nurse, Basic infrastructure facilities for all medico-legal centres with necessary equipment, statistics and costing of injured patients and prevention programmes to minimize accidents and violence are some of the recommendations from the authors.

Keywords: Clinical forensic cases; medico-legal service; new challenges

INTRODUCTION

There are several types of clinical forensic cases examined at North Colombo Teaching hospital. The statutory requirement laid down by the Department of Health instructs that doctors must inform the police about all patients who are seen in a hospital for treatment of injuries sustained as a result of accidents, assaults, sexual abuse[1]. In each and every case the doctor, has to record all the findings and must try to keep the story in line and proceed chronologically through the events[2]. The detailed analysis of cases would help to enhance patient care, identify the required skills of the doctor, improve required facilities and correct lapses in the system[3]. Since the examining doctors accommodate medico legal cases on a 24 hour roster basis it is imperative to know whether the level of care given is similar at any given occasion. In Sri Lanka the medico legal system has a long history and it is vital to know whether the existing system is strong enough to meet the current challenges with regard to patient care and other medico legal issues. This study helped to identify shortcomings and areas of improvement.

OBJECTIVES AND METHODOLOGY

The specific objective of the study is to do a quantitative analysis of forensically relevant clinical cases examined at North Colombo Teaching Hospital with a view of identifying lapses in the medico-legal management and suggest recommendations to improve the system. The data was collected by analyzing

the completed Medico-legal Examination Forms (MLEF) and personal notes made by the examining doctor attached to Department of Forensic Medicine at the North Colombo Teaching Hospital. The data of each clinical forensic case examined during the period commencing from January 1st 2012 to June 31st 2012 was extracted into a pre-planned work sheet by the investigators and analyzed using a SPSS package. A total of 187 clinical forensic cases which were examined during the said period were included.

RESULTS

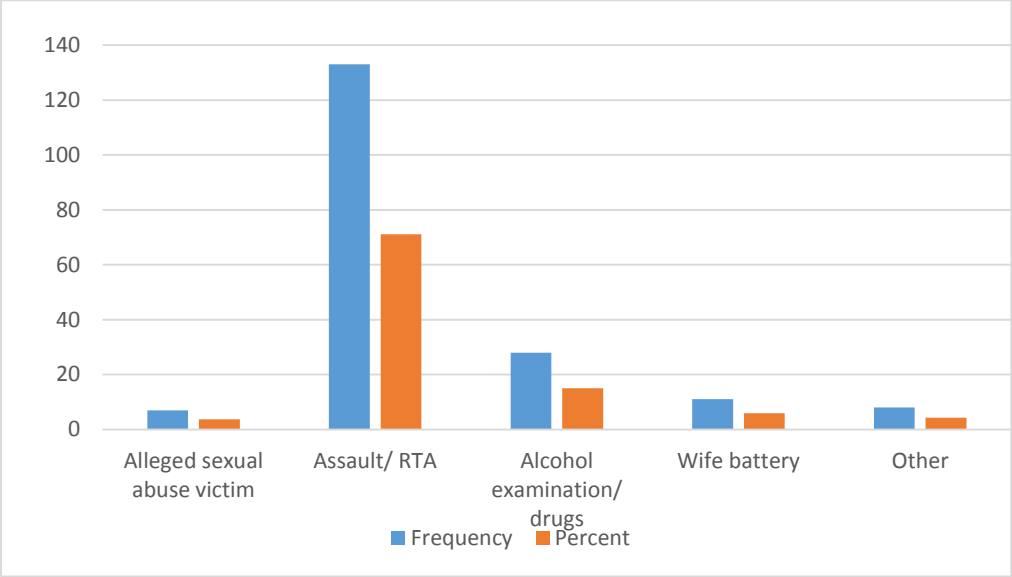
The study revealed that the majority of the victims were male (73.3%) and belong to the age group of 19-59 years (84%). This is followed by the 13-18 years (8%). The least affected were children below 12 years (1.60%).

The victims who were examined had sustained injuries mainly due to assaults and accidents. (71%) Wife battery amounted to 5.9% of the cases. The victims who were produced for intoxication following alcohol/drugs attributed to 15% of the total cases. Alleged sexual abuse victims accounted for 3.7% of the cases. The other group of miscellaneous cases mainly involved burns and no referrals were received for falls or occupational injuries.

Table 1: Age distribution

Age (years)	Frequency	Percent (%)
<12	3	1.6
13-18	15	8.0
>18 (19-59)	157	84.0
>60	12	6.4
Total	187	100.0

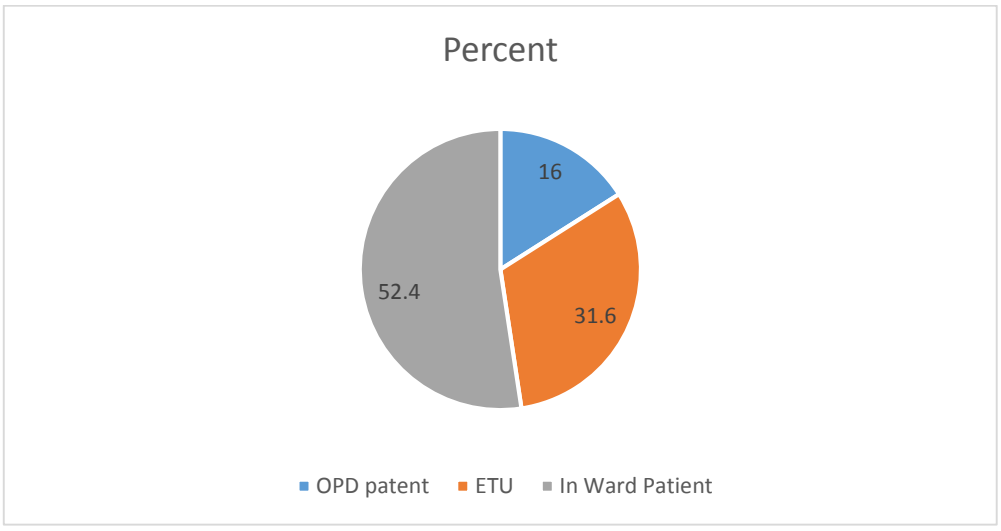
Distribution of the examined clinical cases



Majority of patients sought medical care during weekdays from 8am to 4 pm (173 cases). Out of the total of 187 patients, the number of outpatient department patients (OPD) were 30, emergency transfer unit (ETU) 59 cases and inward patients were 98.

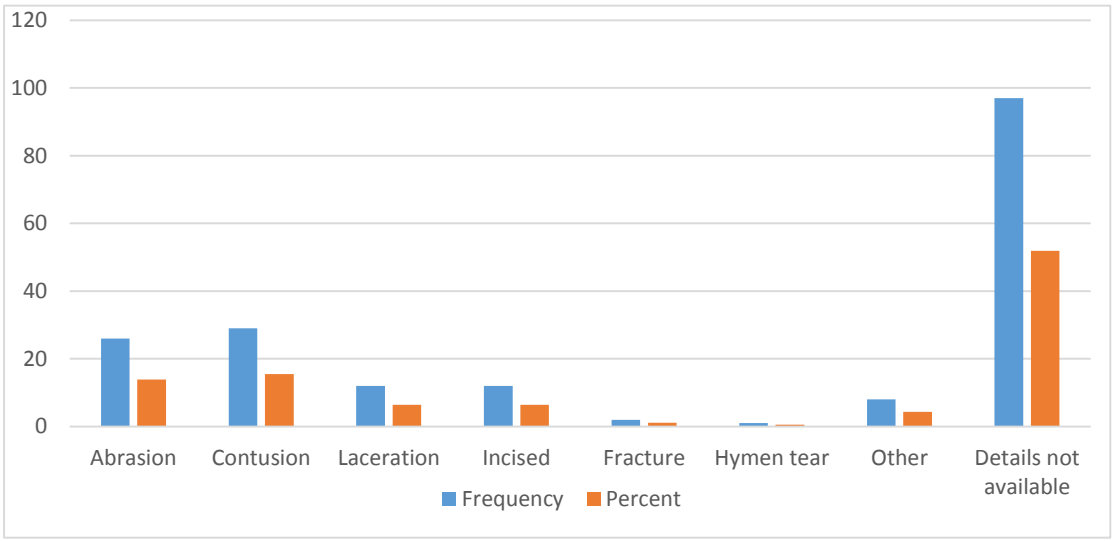
Out of the 187 patients 100 patients were examined in the ward and 80 patients in the JMO office. The other seven patients included PCU and other places. Out of 187 patients 74 patients were examined in a separate examination room.

Clinical cases in the hospital



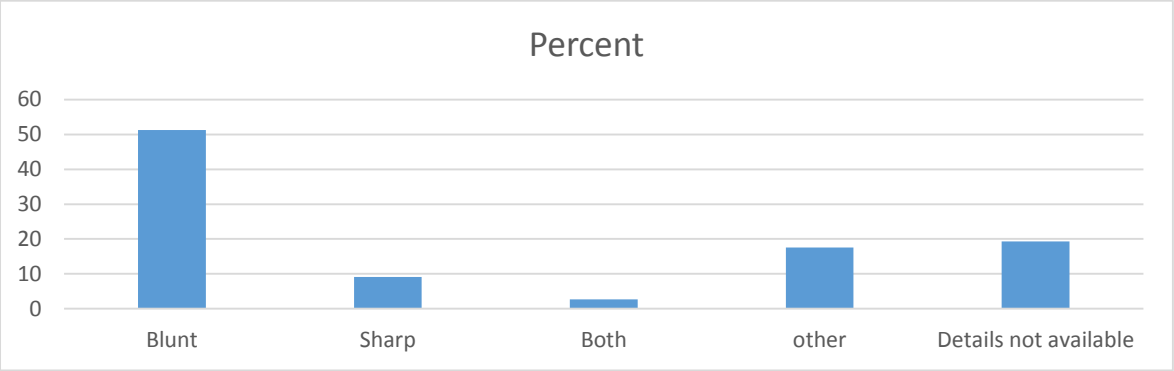
The pattern of injury distribution of the affected victims was as follows.

Different types of sustained injuries



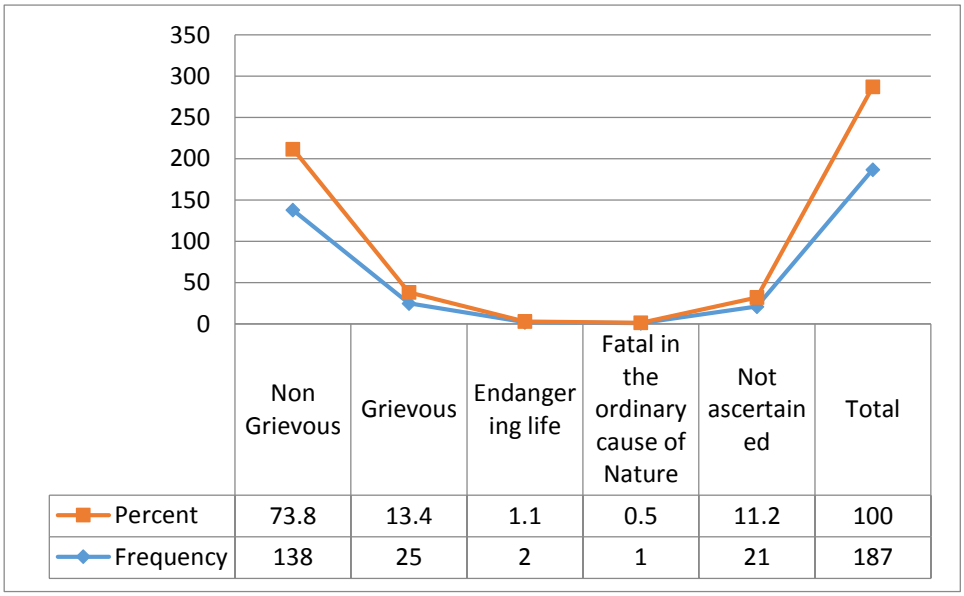
The abrasions and contusions were the common among the recorded injuries. However 51.7% could have been due to the combination of several injuries which is the usual phenomenon following trauma. The lack of analysis of several combinations of injuries may be a drawback in this study however it may not deter the outcome of the study. Out of the 187 patients 112 were subjected to radiological examinations.

Type of weapon



When it comes to the type of weapon which caused the injuries 51.3% of the injuries were caused by blunt force trauma. Sharp force trauma was responsible for 9.1%% of the injuries. Both types of injuries were present in 2.7% of cases. The category of hurt of the individuals according to the Medico Legal Examination Form (MLEF) revealed 73.8 % of individuals were categorized as nongrievous hurt. Grievous hurt attributed to 13.4% and endangering life (1.1%) and fatal in the ordinary course of nature (0.5%) (FOCN) were 1.6%. The rest may be awaiting (11.2%) follow up due to need assessment from referrals or further examination of injuries.

Category of Hurt



	Non Grievous	Grievous	Endangering life	Fatal in the ordinary cause of Nature	Not ascertained	Total
Percent	73.8	13.4	1.1	0.5	11.2	100
Frequency	138	25	2	1	21	187

Ninety six percent of patients were issued MLEF by the police approximately within 24 hours of admission to hospital and 68% of cases finished medico-legal work within 24 hours following the issuance of an MLEF. 18.2% of the individuals were positive for both breath smelling and under influence of alcohol. 2.7% were under influence of drugs.

In only 20% of the personal notes of the doctor the occupation of the victim was mentioned. Date of discharge is mentioned only in 24% of cases.

Twelve patients needed special instruments such as glass rod, magnifying glass and speculum. Eight patients needed samples

such as blood, vaginal swabs and smears for special investigations. 112 patients needed radiological examination. Out of 187 patients 172 were walking and 15 were bed ridden. There were 34 alcohol related and 5 drugs related cases. There were 13 cases which needed specialist referral out of them eye-1, ENT-1, odontology-3, forensic odontology-1, psychiatry-4 and other types of referral-3.

DISCUSSION

The study revealed that a large number of patients who came to hospital with MLEF were males and between the age group of 18-59 years. The majority of the medico legal cases were due to assault and road traffic trauma (71%). The sexual assault cases were also recorded (3.7%). There were patients with other types of injuries (4.3%) such as burns, eye, ear and dental injuries. The adult males are more prone to sustain injuries due to violence and accidents probably due to their involvement in work outside the house and other activities which result in altercation. In comparison the children and elderly are found to be less prone to injuries related to accidents and violence. In Sri Lanka males are mostly the bread winners in a family.

Injuries are a major and persistent public health problem but a comprehensive and detailed over view of the economic burden is missing when considering the quantitative analysis of medico- legal cases. A study done in Netherlands had highlighted the costs involved in managing injuries (4). The World report on violence and health is the first comprehensive review of the problem of violence on a global scale – what it is, whom it affects and what can be done about it (5). This study poses a challenge in considering cost effectiveness when managing a patient with injuries following assault and accidents.

Among the injuries with the available data most common is the abrasions and contusions and cut injuries are the least when a single injury is considered. It should be kept in mind that most of the time victims sustain injuries as a combination rather than an isolated injury. Blunt weapon injuries are more common than the sharp weapon injuries. This is due to the availability of weapons, intention of the perpetrator, etc. The significant amount of the injuries in the study population was categorized as non-grievous hurt. Priority health-risk behaviours, which contribute to the leading causes of morbidity and mortality among youth and adults, often are established during youth, extend into adulthood, are interrelated, and are preventable(6,7). This is true in this study since another major challenge for the next century is the prevention of these injuries. Therefore a more detailed study of the injury pattern with careful analysis will enhance the medico-legal as well as the healthcare system.

Another important factor which had to be highlighted from this study is the exposure of victims to radiological examinations. A total number of 112 patients were subject to x-rays. If the x-rays were really warranted for screening and management purposes then of course it must be performed. Further as mentioned before the different combinations of injuries were not extensively analyzed the necessity of ordering investigations should not be underestimated. In the context of practicing evidence based medicine when ordering investigations especially x-rays which is vital when confirming a fracture for medico-legal purposes the real challenge is the appropriateness of investigations.

It had to be mentioned that a sizable number of patients were examined at the office of the Judicial Medical Officer. A proper examination room to do a detailed examination and record injuries is the need of the hour. Doctors have to examine fresh injuries which are having dressings or sutures. Some cases are referred for blood drawing such as alcohol intoxication and blood samples for DNA analysis. When considering examination of victims following sexual assault the presence of a

forensic nurse would benefit both the patient and the examining doctor. Here the challenge is upgrading the existing system with suitably qualified staff.

It is true that most of the city centres may have these facilities but the standard of care should prevail the same in all parts of the country. The examination room should have all the facilities to collect samples for necessary investigations. Further making available the services of a forensic nurse would uplift the professional standards of handling a clinical forensic case[8,9,10].

In only 20% of the MLEF personal notes of the doctor the occupation of the patient was mentioned. MLEF has no place to document the occupation of the patient. If injuries are related to occupation and in special cases like compensation or sexual abuse if there is a place in MLEF for occupation it will be filled automatically by the relevant doctors. The study pose a new challenge in modifying the existing MLEF to accommodate other relevant information.

Date of discharge is mentioned in 24% of cases only. Most of the MLEF are issued on the 1st day of the incident and if there is no special reason, most of the patients were seen by judicial medical officers within one day of period. Although medico-legal procedures of the patient are completed within few days' time the medical management may not be over. So the patients have to wait in the hospital even after filling of the MLEF. It was found that if there is no special reason to review the patient, most of the MLEF recordings the doctors could not enter the date of discharge which is essential to fill the Medico Legal report. Therefore this shortcoming also needs to be addressed. The number of days of hospital stay also matters especially in compensation cases. The expected new challenge is to device a system to address civil compensation cases. When considering civil compensation cases the mere categorization of hurt would not be sufficient. The disability in each patient is vital when deciding the amount of money in civil compensation cases. Therefore the medico-legal system must be restructured to address civil compensation cases.

LIMITATIONS

This study involved a limited number of clinical forensic cases. Large number of data may further strengthen the already arrived conclusions and identify new problems.

The following information were not catered when collecting data since no cages exist in the current MLEF to collect information such as occupation, duration of hospital stay, reason for referral, fitness for detention, fitness for driving a motor vehicle and permanent disabilities for compensation. Though this is a prospective study with a designed questionnaire the tendency to miss information was observed. This is because while examining a patient the usual practice is always there to collect information relevant to the MLEF and Medico Legal Report (MLR).

CONCLUSIONS AND RECOMMENDATIONS

A sound medico-legal service is important for the existence of a good criminal justice system. MLEF is an important tool to gather vital information. A modified MLEF, Forensic Nurse, Basic infrastructure facilities for all medico-legal centres with necessary equipment, statistics and costing of injured patients and prevention programmes to minimize accidents and violence are some of the recommendations from the authors.

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The text of full papers should be divided into Introduction, Materials and Methods, Results, and Discussion. Only generic names of drugs should be given, if applicable. Abbreviations should be spelt out when first used in the text. Scientific measurements should be given in SI units. Statistical methods should be specified in the methods section and any term which is not in common usage should be referenced.

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