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EDITORIAL

MEDICAL NEGLIGENCE AND MALPRACTICE LITIGATIONS IN SRI LANKA: WHY IT IS A TIP OF AN ICEBERG?

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Many have raised their eye brows at the alarming number of medical malpractice, negligence and medical errors that occur daily world over. Despite advances in medicine, cases of medical negligence and mal practice seem unavoidable. Majority of such cases are attributed to personal negligence, recklessness or wilful blindness of the practitioner. Indeed, the development of law especially the common law related to handling emerging challenges arise with medical malpractice seem to curtail the purported damages that can be faced by people in many countries. However, ironically neither the law nor the jurisprudence in Sri Lanka appear to proactively engage in solving issues related to medical negligence and malpractice.

While many developed countries evidently maintain the significance of highlighting medical malpractice as a social issue, Sri Lanka, on the contrary surfaces a rather lethargic or silent attitude on the issue of medical malpractice. Of course there are a few cases brought up in daily news and media coverage but unfortunately they do not all reach legal remedies or justice due to numerous reasons. Given

the significant number of incidence of adverse events and negligence in developed countries for example in the USA as illustrated by Harvard study (1991), in the UK (Goldberg, 2011) and Australia (Bismark, 2013) one could reasonably assume that Sri Lanka could have much more than what is reported in the west. The reality is that the reported cases of negligence in medical practice are just a tip of an iceberg. This paper therefore attempts to argue reasons for the under reporting of medical negligence and malpractice issues in Sri Lanka.

First of all we in Sri Lanka do not have a system to register, maintain and follow up medical litigation cases. It will be a good idea to implement a centralised registry in the ministry of health where all complaints and litigations regarding medical care are required to be registered. A designated officer from this registry will have the responsibility to follow up and feed new details of all cases and complaints as to what has taken place regarding the incidents. A process of this nature will not only help to identify root causes for such errors or malpractice so that they can be used in

policy reforms but also they will be useful resource for research.

Noting the under reported cases of medical negligence, ignorance among general public on medical aspects remain a major attribute to under reporting of negligence cases. The closed system in Sri Lanka is such that the information regarding the patient is not easily accessible to the patient or the family. There is no one in the ward set up or in clinic set up to ask details. Busy doctors have loads of patients to clear up in busy clinics or wards. Of course most medical practitioners have a private practice, so that it is likely that they want to spend as less time as possible in the state set up to save time and energy for private practice. Most practitioners are blamed for lack of communication skills. This reason avoids patients receiving detailed information. On the other hand even if patients receive information, it is unlikely that most will understand the contents of it.

The public belief that the hospital or the medical staff will always do the best for the patient seems to still exist in Sri Lanka. This means that patients will entirely trust the medical team. Notwithstanding such bestowed trustworthiness upon practitioners, many seem to speculate now that medical staff too can err or mistake. In the face of such changes in belief, it is apparent that there is a growing demand of speculation and skepticism about medical management at present.

Having considered ignorance of many on matters related to medicine and its practice and the heightened trust placed upon medical staff, it is now important to highlight the symbolic

posture society has placed on health and health care practitioners. Certainly the roots of an elevated symbolism on medical profession is grounded on the value society has on human life. Simply, this symbolism explains the value enshrined upon those who are trained or to care for the sick to alleviate pain and regain life. In the same vein, the extrapolated social symbolism constructed on the health care profession, coupled with the finances they earn posits the practitioner in a socially elevated position, which in turn allows development of an assumed power structure within the person as well as in the profession. This creates a power imbalance especially between the poor and the professionals which then can end up in the poor 'giving in' to the power, despite their gut feeling of an injustice or mal practice.

An equally important aspect to consider is the lack of alternatives other than a court process for medical malpractice cases. Of course, there can be institutional inquiries and inquiries at Sri Lanka Medical Council level, however the use of these also are limited. But, we can consider alternate dispute resolutions or mediations for suitable cases. The expense parties have to bear and the legal costs and the length of time taken to conclude civil cases in courts are other reasons for reluctance among people to take actions against medical negligence.

Certainly, some people may refrain from taking action although they feel there was negligence especially in the public health sector, because the provision of health they received was free. They may feel reluctant or rather uncomfortable to go against people who treated their loved one free of

charge. It is however important to note that the medical staff is working for a salary and that they have a responsibility to the patient as well as to the state who pays them to perform with good standards and quality. Noting the compelling nature of any such irregularity or negligence by a health care practitioner, many fear to make allegations in public or to responsible bodies. The central concern with this fear is associated with possible revenge from medical staff when they or their relative come for treatment next time.

Despite the loss people may have experienced, some may tend to think that it is useless trying as either the loved one is already demised or the body part is already taken off. Proponents of this view will opine that a compensation in the form of money will not make an equitable

compensation, for example replacing the lost loved one. Others may attribute the loss to 'karma' or fate. People have fear that even the court system will favour the medical staff. Considering the close connections they may have or undisclosed duress they may have being patients the selves of the alleged doctor, it is possible that people will speculate some biasness towards the powerful professions. Nonetheless, some may accept that the staff had made a mistake without any inquiry.

While medical negligence and malpractice are considered to be important social issues in many countries, Sri Lanka as shown above does not seem to be very much concerned with malpractice litigation, of course due to many reasons out of which some have been highlighted above.

A MAN WITH ISCHEMIC HEART DISEASE AFTER CONSUMING ALCOHOL FOUND COLLAPSED WHILE EATING: A CAFÉ CORONARY AND INTOXICATION. WHICH CAUSE PRECEDED THE OTHERS?

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ABSTRACT

Introduction

Complete and abrupt upper airway obstruction by a bolus of food, with sudden onset of symptoms simulating acute myocardial infarction was described as 'Café coronary' in early 60s. Victims are speechless and breathless; thus, without assistance (e.g. Heimlich manoeuvre) they will die.

A typical 'café coronary' was an obese middle aged man dying, while eating having a chest pain, with eye witness accounts of 'choking on a piece of meat' which was hurriedly eaten. Though various theories were postulated at that time regarding the mechanism, later studies showed that multiple factors could be associated.

We report a death of an alcoholic with a history of ischemic heart disease found with a bolus of food lodged at the pharynx and larynx.

Case Report

51 year-old male after having 1½ bottles of illicit liquor, quarreled with the wife and left home, was found dead two (2) hours later in a partly built house. The examination of the scene revealed half a bottle of alcohol, a partly consumed loaf of bread, a beef curry and a roasted chicken thigh beside.

Autopsy revealed obstruction of the mid larynx with a piece of bread, mild laryngeal oedema, myocardial fibrosis, 80% narrowing of the anterior descending artery and a liquor smell from stomach. The toxicological screening revealed 200mg/dl ethyl alcohol in the blood, while histology revealed fibrosis of the myocardium.

Conclusion

Although obstruction of the airway with a food bolus was the apparent cause of death at autopsy, the high blood alcohol level with myocardial fibrosis poses questions regarding the mechanism of death i.e. which caused which? Therefore, a forensic pathologist should not be hurried to arrive at conclusions during the autopsy without further investigations.

Key words: alcoholic, ischemic heart disease, bolus of food, cafe coronary

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INTRODUCTION

Middle aged person's collapsing, while eating erroneously, was thought to be due to ischemic heart disease, was termed as 'café coronary': Sudden deaths in restaurants, by Haugen in 1963, was found to be due to complete and abrupt upper airway obstruction by a bolus of food, especially at the glottis.¹ Although the mechanism of death is asphyxial in nature i.e. choking, many reasons have been postulated as underlying or contributory factors, such as elderly or very young; edentulous status, gulping of food, neurological impairments ranging from cerebro-vascular disease to parkinsonism, sedatives, anti-psychotics and alcohol.^{2,3,4,5} Choking or foreign body impact in the upper respiratory tract is an emergency where the victims are speechless and breathless; thus without assistance (e.g. Heimlich manoeuvre) they will die.⁶ Though investigating of a 'typical café coronary' or a choking death due to impact of a bolus of food in the upper-air way looks easy, when multiple pathologies are existing, it has often become difficult and even impossible to postulate the exact mechanism of death. We report a sudden death of an alcoholic with history of ischemic heart disease with a bolus of food lodged at the pharynx and larynx at the autopsy.



Photograph 1: the obstruction at larynx

CASE REPORT

51 year-old chronic alcoholic, after consuming 1½ bottles of illicit liquor, has come home in the evening and asked about dinner. When his wife told its bread and pol sambol, he had assaulted her and left home. Two (2) hours later, his son found him collapsed in a partly built house next to their home. When he was brought to the hospital, he was pronounced dead. The examination of the scene revealed half a (½) bottle of alcohol, a partly consumed loaf of bread, a beef curry and a roasted chicken thigh where the deceased was found. According to the family, although he was suffering from ischemic heart disease and hypertension, he has not been taking medication regularly.

The autopsy revealed almost complete obstruction of the mid larynx with a piece of bread (Photograph 1 and 2), mild laryngeal oedema, myocardial fibrosis, 80% narrowing of the anterior descending artery and a liquor smell from stomach. The toxicological screening revealed 200mg/dl ethyl alcohol in the blood, while histology revealed fibrosis of the myocardium.



Photograph 2: the food bolus at mid

DISCUSSION

Medico-legal investigation of a sudden death involves not only finding the cause of death, but also the possible mechanism of death, as well as an opinion on historical corroborations leading to circumstance of death. The case on discussion had three main findings; namely, bolus of food obstructing the air way, high blood alcohol level, coronary atherosclerosis and fibrosis of the heart.

A food bolus obstructing the airway leading to reduction of oxygenation of the blood will cause death within a few minutes. In fact, it is well known that the brain cells cannot survive without oxygen for more than 4 minutes. Thus, in choking, death is very quick because the airway is obstructed and oxygenation cannot take place in the lungs. Although hypoxia is the most likely mechanism in choking, most of the times features of anoxia or hypoxia such as oedema, cyanosis, peteche, are usually absent, since there is no effects on venous drainage. Since the death is quite rapid, an alternative mechanism has been suggested in forensic literature i.e. neurogenic cardiac arrest following vagal stimulation.^{7,8} Although both mechanisms are possible in any death, whether death is due to only one mechanism is impossible to comment. As literature on café coronary mechanism of death has been debated, it is most likely that both mechanisms operate at a given time.^{9,10,11}

Alcohol is a cerebral depressant and it is well known that blood alcohol affects all neurological functions including the cough and gag reflexes. Blood alcohol above 300ml is known to cause alcohol poisoning and death due to effects on the vital centers of the brain.¹² The deceased had a blood alcohol level of 200mg/dl; although it is not at a level producing coma and death, it is a very significant high level to have a reduction in the reflexes. Thus, it can be

concluded that alcohol level of this person had an effect on gag and cough reflex, which is needed to save his life, thus leading to neurogenic cardiac arrest. Further, alcohol is known to cause ventricular arrhythmias and sudden death.¹³ Hence, the contribution of alcohol to either situations is a high possibility rather than a probability.

The presence of ischemic heart disease is a factor which we have to consider if we are to find which preceded which. Fibrosis of the heart is a well-known factor causing ventricular fibrillation and as well as other forms of arrhythmia especially when combined with alcohol and emotion.¹³ Since ventricular tachycardia is a physiological phenomenon, postmortem sings/ findings are often absent. Thus, analyzing autopsy findings and postulating possible mechanisms is crucial to a forensic pathologist especially in a situation of this nature where death has not been witnessed.

The type of food being consumed is a significant factor in these types of deaths. Although 'Café coronary' was first reported while eating meat with alcohol, a large series of café coronary deaths caused by other soft or semisolid food have also been found being involved, especially when they do not have molar tooth for mastication.^{14,15} Although studies on café coronary deaths are hardly found from South Asian region where food consist of more fiber/vegetable material, two case reports of café coronary death due to banana are reported from Sri Lanka and India.^{16,17}

CONCLUSION

Obstruction of the airway with a food bolus when found in association with high blood alcohol level and myocardial fibrosis, a forensic pathologist has to pause regarding the mechanism of death i.e. which caused which before giving an opinion. In this case, although the main cause was choking, the contribution of alcohol and the ischemic

heart disease were significant because they too can contribute to death as well as mechanisms of death. Thus, a forensic pathologist should not be hurried to come to conclusions at autopsy without further investigations.

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CRIME AND MENTAL DISORDER: A LITERATURE REVIEW

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ABSTRACT

Conceptual uncertainty exists surrounding the term “mental disorder”. It is generally possible to locate a physical cause for physiological diseases making the diagnosis more precise and accurate. In contrary to this, the attribution of “mental disorder” is a subjective assessment usually formed within a given medical and legal framework of the country, mostly influenced by the culture, religion and other sociological factors too. The word “disorder” is the preferred generic term in psychiatry today as classification and labeling of certain mental conditions/states as “illnesses” is a focus of debate. Since the beginning of the human history, the society has associated mental disorders with crime; particularly the more violent forms of crime. Public opinion surveys show that people across the globe think that mental disorder and crime go hand in hand- a misconception revived and propagated mostly by the media. For example, a national survey conducted in 2006 found that 60% of Americans thought that people with schizophrenia were likely to act violently toward others. This article attempts to review the current literature so as to better visualize the yet unsettled proposition of crime and mental disorder.

Key words: *violence, mental disorder, crime, schizophrenia, sociopathic disorder*

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INTRODUCTION

The phrase “crime and mental disorder” could be looked at in several angles. Is there any association between the mental disorders and crimes/violent behavior? If so, what are the specific types of mental disorders that could be linked with crime? What are the common types of crimes committed by the mentally disorderly? Are individuals with mental disorders more prone to be victims of crimes? If so, what types of crimes are more likely to be committed on such individuals? People with mental illnesses/disorders may be at a greater risk of arrest.¹ In a study conducted by Teplin in 1984-85 in the USA, out of 506 persons suspected of committing a crime, 30 were suffering from a mental disorder. This study showed that a significantly high proportion (47% against 28%) of those with mental disorders was arrested compared to those who were mentally healthy. However, there was no significant difference between the types of crimes suspected to have been committed by the two groups. This study could not establish that the mentally disorderly are more prone to criminal behaviour. After extensively reviewing the recent literature, Bonta and others established that the mentally disordered offenders did not show a greater tendency to commit crimes than the mentally healthy.² When trying to establish or refute the association between crime and mental disorders, it could be investigated in two angles: the prevalence of mental disorder in a population of known criminals and the prevalence of criminal behavior among known psychiatric patients.

DISCUSSION

Mental disorders among criminals

In the developed world, there is a tendency that many mentally disordered offenders would be filtered out of the criminal justice system at an early stage. Therefore most of the studies are based on prison populations. Very few researches had been conducted on court samples. Coid describes two such studies, one as early as in 1940s.³ Both indicated relatively low rates of mental disorders among criminals. More recent studies suggest that psychological problems are common among prison populations. Gunn et al. in 1991 have conducted an extensive survey among 5% of the male prisoners in England serving a sentence of six months or more and found that 37% of them were suffering from some kind of psychological disorder.⁴ In a similar survey conducted by the same authors in 1978, (13 years prior to the one mentioned above as reference 4) it was revealed that 31% of convicted prisoners were suffering from some sort of psychological disorder.⁵ In both occasions (reference 4 and 5) the prevalence of major psychotic disorders among the prisoners was 2%. In another study conducted by Taylor on both male and female life-sentence inmates in London prisons, it was revealed that the prevalence of major psychotic disorders among them was as high as 10%, schizophrenia being the commonest.⁶ Teplin claimed that presence of severe mental illness among prison populations varied between 4%-12%.⁷ Birmingham and others on their study on remand prisoners in Durham, found that 26% of them had suffered from one or multiple mental disorders excluding substance abuse. 4% of them were diagnosed as suffering from major psychiatric illness.⁸ Brooke and others in their study on remand prisoners in thirteen adult prisons and three juvenile institutions in England found that 5% of them were suffering from major psychotic illness which they estimated as between 4 and 5 times the level found in the general population.⁹ Singleton and others in an

extensive research on inmates from entire prison population in England found that 63% of male remand prisoners had an anti-social personality disorder while 14% of female prisoners were psychotic.¹⁰ Similar findings were revealed by Fazel and Danesh where 3.7% of male prisoners were suffering from major psychotic illness, 10% from major depression and 65% from any form of personality disorder.¹¹ Gosden and others found that almost 70% of male adolescent remand prisoners suffered from any form of mental disorder during the previous twelve months.¹² Birmingham and others discovered that routine health screening upon reception into prison often failed to identify and detect mental disorder both in the convicted prisoners as well as in remand prisoners.¹³

Though extensive research is available as mentioned above, such findings do not necessarily provide conclusive evidence towards the link between mental disorder and crime. This is due to alternative explanations. For example mentally disordered offenders may be more vulnerable to be "caught" by the public or the law enforcement authorities due to their inept behavior. Furthermore, the police may have a low threshold in charging such individuals. Also, the police and the courts may consider that conviction is the best method to keep them away from the society and provide them with compulsory treatment. Naturally, guilty pleas will be commoner among those with mental disorders. Mental disorder could have been developed subsequent to offending and sometimes as a result of incarceration in undesirable prison conditions itself.^{14,15}

Criminal behavior among the individuals with mental disorders

This is the second approach to investigate a link between crime and mental disorder. Here, the researchers look at the crime rate among psychiatric patients (and compare it with that of the general population). Brennan and others found that those suffering from major psychiatric illness

showed a greater risk of arrest for violence.¹⁶ Steadman and others concluded that offending by psychiatric patients was more related to the factors which serve as general predictors of violence (such as age, gender, ethnicity, social class and etc.) than to their mental disorder.¹⁷ Toch and Adams studied the previous offences of a population of mentally disordered prisoners and found that all of them were going through considerable psychological disturbances by the time they have committed their previous crimes.¹⁸ Most of the research focuses on the mental illness and violent forms of crimes such as rape and murder. Relatively little research has been conducted on petty crimes such as shoplifting. Gibbens¹⁹ and Taylor and Gunn²⁰ both suggest that there is an over representation of mental disorder among those convicted for arson or criminal damage. The relationship between mental disorder and risk of violence (“dangerousness”) was promoted by the psychiatrists of by-gone era when they could not find a plausible alternative explanation to account for serious crimes.²¹ Though the modern-day psychiatry does not fully support this idea, there is still a common belief that the mentally disorderly are particularly prone to violent behaviour. It is prudent to find out how evidence-based this proposition is. Taylor and Gunn in their research based on remand prisoners either charged with or convicted of a homicide offence; found that 9.3% showed symptoms of schizophrenia, 1.9% affective psychosis and 26% ‘mixed disorders’.²² Hafner and Boker in their German research concluded that schizophrenia is the type of mental disorder most clearly connected with serious and violent crimes though the percentages are quite low (about 0.05 percent of all schizophrenics).²³ There is also evidence that people suffering from psychopathic disorder are prone to violent crimes. Black and Spinks found out that psychopaths are more likely to indulge in violent crimes than those suffering from other forms of mental disorders.²⁴ Hare and others established a higher recidivism rate for most crimes among the psychopaths than those suffered

from other types of mental disorders.²⁵ Jameison and Taylor focusing on discharged patients from three English high-security hospitals concluded that two thirds of those classified under the legal category of “psychopathic disorder” have resorted to violent crimes within the next two years of discharge.²⁶ There is also evidence that post-traumatic stress disorder (PTSD) could be associated with crime and violence. Solursh studying a sample of 100 American Vietnam-War veterans suffering from PTSD; found out that 94% had a pattern of “combat addiction” where nightmares or flashbacks experienced as a ‘high’ had alternated with periods of severe depression.²⁷ Collins and Bailey studying a prison sample of 1140 males; established a relationship between PTSD and violent crime excluding armed combating.²⁸ Here, the 2.3% who satisfied the strict criteria of PTSD showed a significantly higher chance of being arrested or imprisoned for a violent offence.

One ongoing problem in the scientific literature is the use of diverse methods (without uniformity) to assess rates of violence both among the mentally ill as well as the control groups. Some studies are based on self-reporting or participant’s recollection of the events. These studies may underestimate the rates of violence due to participants being reluctant to admit resorting to violence, forgetting what they did in the past or lying. Some other researchers have relied upon the data in the criminal justice systems while yet others have not controlled multiple variables beyond substance abuse that contribute to violent behaviour such as stress, poverty, personal adversity or family history. The MacArthur Violent Risk Assessment Study was designed to eliminate such bias.²⁹ This is considered as one of the first researches to address the design flaws of the earlier researches. The designers counted on three sources of information simultaneously in the assessment of rates of violence: interviewing the participants multiple times to assess self-reported violence on an ongoing basis, verifying the participant’s

memory by cross-checking with multiple sources (such as family members, case managers) and finally getting information from arrest reports and hospital records. This study showed that 31% of people who had a so called “dual diagnosis” of substance abuse disorder and psychiatric disorder, committed at least one act of violence a year compared with 18% of people with a psychiatric disorder alone. This confirmed that substance abuse is a key contributor to violent behaviour. After controlling for substance abuse, rates of violence reported in the study may reflect factors common to a particular neighbourhood rather than the symptoms of a psychiatric illness. In two other best designed studies, investigators from the University of Oxford suggested that shared genetic vulnerability and common elements of social environment (poverty, early exposure to violence) were at least partially responsible for violent behaviour though rates of violence increased dramatically in those with a dual diagnosis of psychiatric disorder and substance abuse.^{30,31} These two studies, taken together with MacArthur study suggest that violence by people with mental disorders stem from multiple overlapping factors interacting in complex ways. These include family history, personal stressors such as divorce or bereavement and socio-economic factors such as poverty or homelessness. Substance abuse is often tightly attached to this scenario making it hard to tease apart the influence of other less obvious factors. The same view is supported by a recent study conducted by Jillian Peterson in 2014 with the patronage of American Psychological Association which is the largest scientific and professional organization representing psychology in the United States.³²

CONCLUSION

It is difficult to establish a firm relationship between mental disorder and crime though there are some exceptions. For example schizophrenia is the psychosis most associated with violence though actual

numbers involved are very small. There is also an established association between psychopathic disorder and violence though violent behaviour is innately incorporated in to the definition of this disorder. Furthermore, though there is evidence that certain types/forms of mental disorder are *associated with* criminality, there is no conclusive proof that the offences have occurred *as a result of* the mental disorder. Although a subset of individuals with psychiatric disorders commits assaults and violent crimes, findings are inconsistent as to how much mental illness contributes in the context of substance abuse and other socio-cultural and genetic factors. The vast majority of people with mental illness are not violent. The public is misinformed by the entertainment and news media about the link between mental illness and violence. These inaccurate beliefs about mental illness and violence lead to wide-spread stigma and discrimination.

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STUDY ON THE PATTERN OF UNNATURAL DEATHS OF WOMEN BROUGHT FOR MEDICO-LEGAL AUTOPSY

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ABSTRACT

Introduction

An unnatural death is an intentional or unintentional death due to external causes. This can often be violent, mutilating or destructive. When the unnatural death involves a female, it shatters the lives of the survivors or the family. Traumatic injuries among females remain under-reported globally and studies on this area are scarce. We planned a retrospective descriptive study to find the epidemiologic patterns of trauma-related mortality among females for the first time.

Objectives

The aim of the study was to analyze the traumatic deaths among females to determine the circumstances, causes and epidemiology of these deaths and also to find the factors influencing them.

Methodology

A retrospective descriptive study was conducted on the post mortem records of the female victims of trauma during last 3 years (2013-2015) reported to a tertiary care hospital of Sri Lanka. The historical details, scene findings, findings of autopsy: external and internal examinations, the results of the post-mortem investigations and the opinion and conclusions given were obtained to fill the pro-forma.

Key words: *unnatural deaths, women, manner, road accidents, poisoning, family disputes*

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Results

Out of the 139 deaths reported for medico-legal examination during the period, the majority 71(51%) were less than 40 years of age. The commonest manner of death was accidents 56 (40%), especially road accidents, followed by suicides amounting to 45 (32%). Poisoning was the commonest method of suicide 14 (31%) followed by hanging 12 (26%). Sharp injuries accounted for the majority of murders 13 (39%). Family disputes and love affairs were the main reason for 21 (47%) suicides and 13 (39%) murders.

Conclusions

Comprehensive research into occurrence of unnatural fatalities assists authorities in the prevention of such deaths. The study highlights the importance of timely interventions on road safety and the need for effective and timely counseling services on family matters to prevent most intentional deaths of women.

INTRODUCTION

An unnatural death is a death caused by external causes (injury or poisoning) which includes death due to intentional injury such as homicide or suicide, and death caused by unintentional injury in an accidental manner.¹ An unnatural death can also be violent, mutilating or destructive. A sudden, accidental, unexpected or traumatic death of a female shatters the lives of the survivors or the family, especially, when their children are young.

The extent of violence in the world has never been fully described. However, in 1996, the World Health Assembly identified violence as a leading global public health problem.² Trauma is the third leading cause of death among all age groups and the mortality rate is remarkably high mainly among young age group.³ Although males are commonly the victims of traumatic deaths⁴, violence against women leading to traumatic deaths have been reported from many countries including India.^{5,6} The statistics and patterns of unnatural deaths vary in different countries. However, unintentional injury (largely motor vehicle accidents and poisoning) is the second leading cause of death among females less than 50 years of age.⁷ When considering motor vehicle accidents, the fatality rate is 3 folds higher among young males (<25 years of age) compared to young females.⁸ However, due to smaller body stature, female occupants were 28-31% more susceptible for fatal injuries than males from a similar crash of a motor vehicle.⁹ Self-inflicted injuries as well as road injuries are among the top 10 causes of death of adult women (20-59 years) worldwide.^{3,10} Burns are among the top 10 leading causes of death among women aged 15–44 years, especially in the South-East Asian region.¹⁰ Intimate partner and family violence as well as cooking accidents are responsible for considerably a higher amount of fire-related injuries as well as deaths among women¹⁰. Intimate partner violence is on the rise among females.¹⁰ Though the majority of victims of suicide are men, attempted suicide is more common among women.¹¹ Traumatic injuries among females remain under-reported globally and studies on this area are scarce.¹² We planned a retrospective descriptive study to find the epidemiologic patterns of trauma-related mortality among females since there is a scarcity of such literature.

OBJECTIVES

The aim of the study was to analyze the traumatic deaths among females to determine the circumstances, causes and epidemiology of these deaths and also to find the factors influencing them.

METHODS

A retrospective descriptive study was conducted on the post-mortem records of the female victims of trauma during the last 3 years reported to a tertiary care hospital of Sri Lanka. Women who are above 18 years of age were included in the study group. Autopsy reports, scene and post-mortem photographs and other case materials such as copies of the police scene investigation findings were perused. The historical details, scene findings, findings of autopsy external and internal examinations, the results of the post-mortem investigations and the opinions and conclusions given were obtained to fill the pro-forma.

Data collected were entered in Microsoft Excel worksheets and analysed using Statistical Package for Social Sciences (SPSS). Graphs and tables will be used as appropriate methods to present the data.

RESULTS

There were 139 women victims brought for medico-legal examination during the study period. The majority 71(51%) were less than 40 years of age. Most victims 112 (81%) were married (Table:1).

Age groups	Frequency	Percentage
< 20 years	19	14%
21-40 years	52	37%
41-60 years	40	29%
>60 years	28	20%
Total	139	100%

40 % were accidental deaths while there were 32% suicides and 24% murders. There were 4% other deaths due to pregnancy and parturition-related issues (Table:2).

Manner	Frequency	Percentage
Accidents	56	40%
Suicide	45	32%
Homicides	33	24%
Other (maternal)	5	4%
Total	139	100%

Among the accidental deaths, the majority (64%) were road accidents while there were 16% burns (Table:3).

Type of accident	Frequency	Percentage
Road	36	64%
Burn	9	16%
Fall	3	5.3%
Railway	3	5.3%
Drowning	2	4%
Other	3	5.3
Total	56	100%

The method used to commit suicide was poisoning in a majority (31%) while there were 27% of hanging incidents among the females who committed suicide (Table:3).

Type of suicide		
Method of suicide	Frequency	Percentage
Poisoning	14	31%
Hanging	12	27%
Drowning	8	18%
Burn	6	13%
Ligature strangulation	3	7%
Train	1	2%
Other	1	2%
Total	45	100%

Majority (40%) of the homicidal deaths were a result of sharp force injuries (Table:3).

Type of homicide		
Type of injury	Frequency	Percentage
Sharp	13	40%
Blunt	10	30%
Asphyxia including drowning	6	18%
Burn	4	12%
Total	33	100%

Cause of death in a majority 54 (39%) was blunt force trauma which included multiple blunt force injuries, cranio cerebral trauma, shock and haemorrhage or chest trauma followed by neck compression in 17% (Table:4).

Table 4: Cause of death

Cause of death	Frequency	Percentage
Blunt force trauma	54	39%
Neck compression	24	17%
Burn and multi organ failure	14	10%
Poisoning	14	10%
Drowning	12	9%
Sharp force	10	7%
Sepsis	2	1%
Other	9	7%
Total	139	100%

Alleged perpetrator in 30.5% of homicides was the husband while a similar percentage was inflicted by a known person to the victim (Table:5).

Table 5: Alleged perpetrator in homicides

Alleged perpetrator	Frequency	Percentage
Husband	10	30.5%
Known person	10	30.5%
Stranger	4	12%
Blood relative	2	6%
Other	7	21%
Total	33	100%

Most of the suicides (84%) as well as homicides (76%) had taken place at home (Table:6).

Table 6: Location of the incident

Suicides		
Location	Frequency	Percentage
Home	38	84%
Public	4	9%
Isolated place	3	7%
Total	45	100%
Homicides		
Location	Frequency	Percentage
Home	25	76%
Public	1	3%
Isolated place	7	21%
Total	33	100%

Underlying reason for suicide as expressed by the relatives and the police was family dispute in a majority (36%) while there were 22% where the reason was not known to the relatives (Table:7). Similarly, the underlying reason for homicide as expressed by the relatives and the police was family disputes in a majority (40%) (Table:7).

Table7: Underlying reason for suicides and homicides

Suicide		
Underlying reason	Frequency	Percentage
Family dispute	16	36%
Love affairs	5	11%
Financial	1	2%
Not known	10	22%
Other	13	29%
Total	45	100%
Homicide		
Underlying reason	Frequency	Percentage
Family dispute	13	40%
Love affairs	0	0%
Financial	0	0%
Not known	12	36%
Other	8	24%
Total	33	100%

Out of the 45 suicides, the majority were young women. On the other hand, older victims were mainly victims of accidental deaths (Table:8).

Table 8: Age Vs. manner of death

Age	Suicide		Accident		Homicide		Other	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
<20	9	20%	6	11%	4	12%	0	0
21-40	24	53%	16	28%	10	30%	2	40%
41-60	9	20%	15	27%	13	40%	3	60%
>60	3	7%	19	34%	6	18%	0	0%
Total	45	100%	56	100%	33	100%	5	100%

Methods of suicide selected by young were hanging and poisoning, mainly. Older victims had selected drowning followed by poisoning to commit suicide (Table: 9).

Table 9: Method of suicide in each age group

Method of suicide	<40		>40	
	Frequency	Percent	Frequency	Percent
Poisoning	10	30.5%	4	33%
Hanging	10	30.5%	2	17%
Drowning	3	9%	5	42%
Burn	5	15%	1	8%
Ligature strangulation	3	9%	0	0%
Train	1	3%	0	0%
Other	1	3%	0	0%
Total	33	100%	12	100%

Out of the 21 victims who died due to family disputes and broken love affairs, the majority (58%) were less than 40 years of age (Table:10).

The reason for homicide among 42% of older victims was not revealed while family disputes were identified as the main reason for homicide among the young (50%) (Table:10).

Table 10: reason for suicide and murder in each age group

Suicide				
Reason	<40		>40	
	Frequency	Percent	Frequency	Percent
Love affair	5	15%	0	0%
Family dispute	14	43%	2	17%
Financial or other dispute	0	0%	1	8%
Not known	9	27%	1	8%
Other	5	15%	8	67%
Total	33	100%	12	100%
Murder				
Reason	<40		>40	
	Frequency	Percent	Frequency	Percent
Love affair	0	0%	0	0%
Family dispute	7	50%	6	32%
Financial or other dispute	0	0%	0	0%
Not known	4	29%	8	42%
Other	3	21%	5	26%
Total	14	100%	19	100%

DISCUSSION

Unnatural deaths indicate the absence of social and mental wellbeing of a society. Especially when it comes to unnatural deaths of women, it can usually be attributed to their long-term deprivation of socio-economic and human rights, thereby reflecting a negative image of the society they belonged. Studying the profile of unnatural deaths is of extreme importance to a country, especially to draw policy in preventive strategies.

The study revealed that a majority 71 (51%) were less than 40 years of age. This has been shown in many other studies, especially the ones done in neighboring India.^{13,14,15} 81% of them were married women, which again is consistent with other studies.^{13,16,17} The circumstances of unnatural deaths of females in our study showed that 40% were accidental deaths while there were 32% suicides and 24%

murders. Similar patterns were also reported from various parts of India.^{18,19,20} However in Bangladesh, the commonest unnatural death of females is related to pregnancy and parturition²¹. Our study revealed only 5 deaths related to pregnancy. This indicates the quality of maternal health services in our country. The maternal mortality rate in Sri Lanka was 31 deaths/100,000 live births in year 2014, according to the World Bank.

Among the accidental deaths, the majority were road accidents (64%) while there were 16% burns. High incidence of road traffic accidents among the females is a representation of the higher number of such accidents among the general population of Sri Lanka. Traffic accident in Sri Lanka shows an ever-increasing trend and an alarming number of fatalities are observed²². The total road fatalities for 2010 in Sri Lanka was 2854. Moreover, Sachi Kumar had reported road accidents as the number 1

accidental killer among females who are the victims of unnatural deaths in Lucknow, India. However, in his study, burns placed 3rd accidental cause of death²⁴.

A review on traumatic injury among females by Ayman El-Menya et al had revealed that low and middle-income countries represent the majority of fatalities from burns. This includes both accidental, homicidal and suicidal burns. The review also shows that women and young children are at greater risk of domestic burns²⁵. Further, many studies have also reported that female gender is at a high risk of death from burns^{26,27,28}. This can be attributed to the use of firewood and kerosene oil used for cooking. The method used to commit suicide was poisoning in a majority (31%) followed by hanging (27%).

It is reported that females are likely to use a method that is not immediately lethal and, hence, poisoning or drug overdose is identified as the main method in other studies, too^{30,31}.

However, the study also revealed that there is a significant number of immediately lethal other methods such as hanging, drowning and ligature strangulation used by our victims to commit suicide. In Europe, the most frequently practiced method of suicide among both genders was hanging; however, it was significantly higher in males than in females³².

The majority (40%) of the homicidal deaths were a result of sharp force injuries. This is consistent with the trends of homicides in UK³³. Sharp force injuries accounted for 22% of the homicidal deaths in Sri Lanka, when war-related fatalities were excluded³⁴. However, in the United States firearm injuries are the commonest method of homicide followed by sharp force trauma³⁵.

The cause of death in a majority (39%) was blunt force trauma followed by neck compression. This contrasts with the studies done in India where burns are the commonest cause of death^{6,19,36}. However,

a study from Manipur had revealed a similar pattern to our study with a large number of road accidents accounting to blunt force trauma³⁷.

Alleged perpetrator in 30.5% of homicides was the husband and there was another 30.5% in which the perpetrator was a known person to the victim. Intimate partner violence has been identified as a public health problem worldwide. Many women are killed by their husbands or intimate acquaintances³⁸. Women are rarely killed by strangers³³. This is commonly reported in Indian studies²⁴. In 2007 intimate partners committed 14% of all homicides in U.S³⁹.

Underlying reason for suicide as expressed by the relatives and the police was family disputes in a majority (36%) while there were 22% of whom the reason was not known. On the other hand, the underlying reason for homicide as expressed by the relatives and the police was again the disputes in the family in a majority (40%). A study into unnatural deaths of married females in India revealed that disputes with husband / in-laws and dowry-related problems were two important reasons behind suicidal as well as homicidal deaths⁴⁰.

Among the suicides the majority (73%) were young women. On the other hand, older victims were mainly victims of accidental deaths. Suicide rates are higher among females of 15-29 years of age worldwide⁴¹. It is well known that older adults or the elderly are the most at risk in pedestrian accidents. In Australia, about 2% of deaths of women aged 65 and over are attributed to non-traffic accidents⁴². Elderly victims have frail bodies and in addition, they have many natural disease conditions that can contribute to death from minor trauma.

Methods of suicide selected by the young were hanging and poisoning in equal numbers. Older victims of suicide had selected drowning to commit the act. A

study done in Virginia revealed that the method of suicide changes with age, with more violent methods like firearm and hanging commonly being reported among the young⁴³. Older females have commonly chosen drowning as the method of suicide as revealed in other studies as well^{44,45}.

Family disputes were the reason for both suicide and murder among the young. This is reported in other studies as well. Violence in families contributes highly to the pattern of homicides worldwide^{40,46}.

CONCLUSIONS

Accurate, timely, and comprehensive research into occurrence of unnatural fatalities assists public health and other authorities in the development, implementation, and evaluation of programs and policies that reduce and prevent such deaths.

The study revealed that the unintentional trauma, mainly the road traffic accidents are responsible for unnatural deaths of females, in contrast to many studies from India where burns are responsible for the majority of such deaths. This highlights the importance of timely interventions of road safety measures. Further, women, especially the young are vulnerable for intentional unnatural deaths associated with family disputes, highlighting the importance of establishing freely/conveniently available counseling services.

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Age and Injury Patterns of Female Survivors of Different Alleged Sexual Assaults Examined in the Teaching Hospital Anuradapura, Sri Lanka

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ABSTRACT

During the year 2014, two hundred and seventy (270) victims of sexual assaults had been medico-legally examined in the Teaching Hospital Anuradhapura. Twenty seven (27) were males and two hundred forty three (243) were females. Retrospective study was done by collecting data from medico-legal reports of all alleged sexually assaulted female survivors. Eleven different categories were identified among alleged sexual assault cases according to the main complaint of the victims. They are:-(1) Eloped with boyfriend before the age of 16 years (age for consenting sex)- 108, (2) Consenting sexual intercourse – 41, (3) Fondling/ Touching– 31, (4) Alleged rape and attempted rape (nonconsensual sexual intercourse)- 30, (5) Intercrural intercourse (thigh intercourse)- 18, (6) Anal intercourse- 5, (7) Verbal abuse- 5, (8) Abduction-(parents suspected sexual assault)- 3, (9) Fingering-1, (10) Exhibition of genitalia- 1, (11) Naked photographs taken after intercrural intercourse-1.

During the year 2014, females between the age of 4 and 78 were sexually assaulted in Anuradapura district. The age range varies with different sexual assaults. The participation in eloping is seen among females between the ages of 12 and 17 years with the maximum number at 15. Consenting sexual intercourse is seen between 12 and 32 years with the maximum number at 15. Fondling and touching were reported between 5 and 42 years with maximum cases at 14. Alleged rape and attempted rape cases are reported between 11 and 78 years with maximum numbers at

13 and 14 years. Intercrural intercourse cases are reported between 4 and 19 years with maximum number at 14 years. Anal intercourse is reported between 5 and 29 years. Sexual verbal abuse is seen at the age of 16 and 18 years. Only case of fingering reported was of a 9 year old, the exhibition case was of 12 year old and the naked photographs taken was of 11 year old.

When examining the victims of sexual assaults of fondling / touch, intercrural intercourse, verbal abuse, abduction and exhibition, physical injuries were not expected and none was found. With regards to victims of elope and consensual sexual intercourse, hymeneal tears were the only findings, except in one case which showed a vulval contusion at 6 o'clock position without hymeneal tear. Single hymeneal tear is the commonest type of genital finding and it is commonly situated at 6 o'clock position. Where there were two hymeneal tears, they were not symmetrically distributed around 6 o'clock position. Bodily injuries were seen only in 5 cases of alleged attempted rape category out of two hundred and 270 alleged sex assaults. Absence of bodily injuries cannot be used to suggest consent or to exclude the victims clinical history in relation to sex assaults during court trials.

Awareness programs to encourage victims to report to police soon after sexual assaults, clinical forensic medicine specialists for major medico-legal units, colposcopic examination of vagina and devices to detect

deep skin contusions are the improvements needed.

Key words: *Sexual assaults, intercrural intercourse, elope, rape, hymeneal tears*

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INTRODUCTION

All suspected sexual assault cases of the Anuradhapura district are referred to the Teaching Hospital Anuradhapura (THA) because medico-legal examination of the sexual assault survivor is very important in court trials to prove the type of sexual assault, physical evidence of the assault and to trace evidence to link the perpetrator. Medico-legal examination is usually performed by a forensic medicine specialist or an experienced medico-legal practitioner. During the year 2014, two hundred and seventy (270) victims of sexual assaults had been medico-legally examined in the Teaching Hospital Anuradhapura. Twenty seven (27) were males and two hundred forty three (243) were females. All had been sexually assaulted by males. This study shows the general picture of the sexual assaults in the Anuradhapura district during the year 2014. The aim of the study is to find the different ages of female victims of different sexual assaults and the injury pattern at the time of medico-legal examination.

MATERIALS AND METHOD

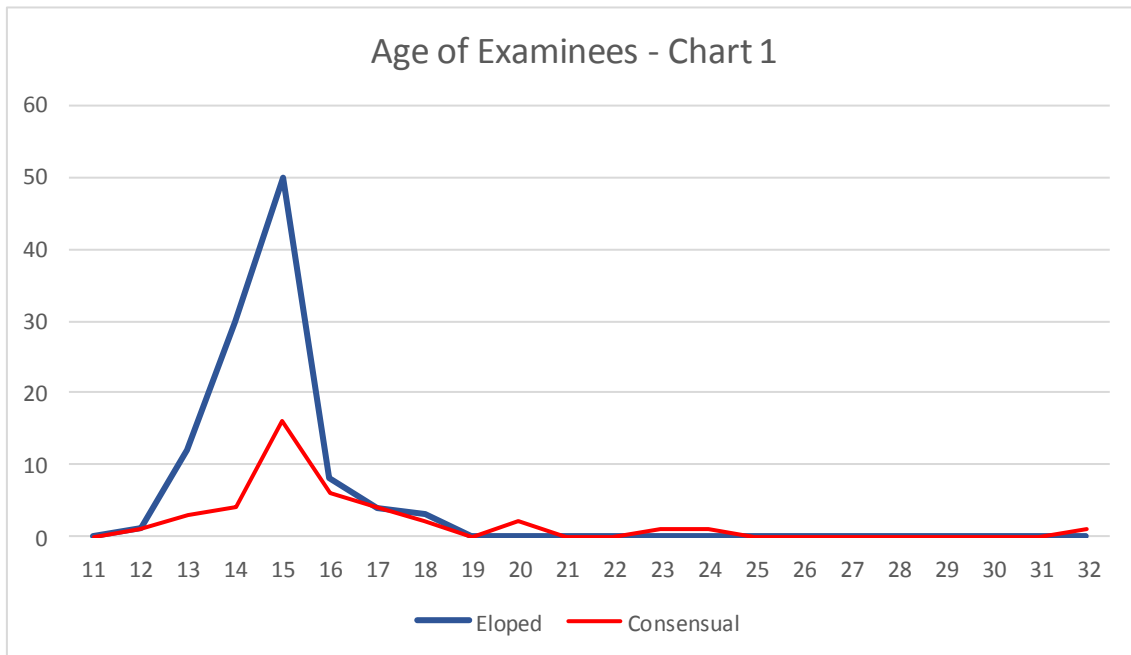
Retrospective study was done by collecting data from medico-legal reports of all alleged sexually assaulted female survivors examined in the medico legal unit of the Teaching Hospital Anuradhapura. Age of the victim and information regarding the injuries were collected from hundred and fifty three (153) medico legal examination forms examined by a consultant judicial medical officer and hundred and seventeen

(117) medico-legal examination forms examined by a senior medico legal officer. They were analyzed according to the main complaint of the victim, age of the victim and injury pattern.

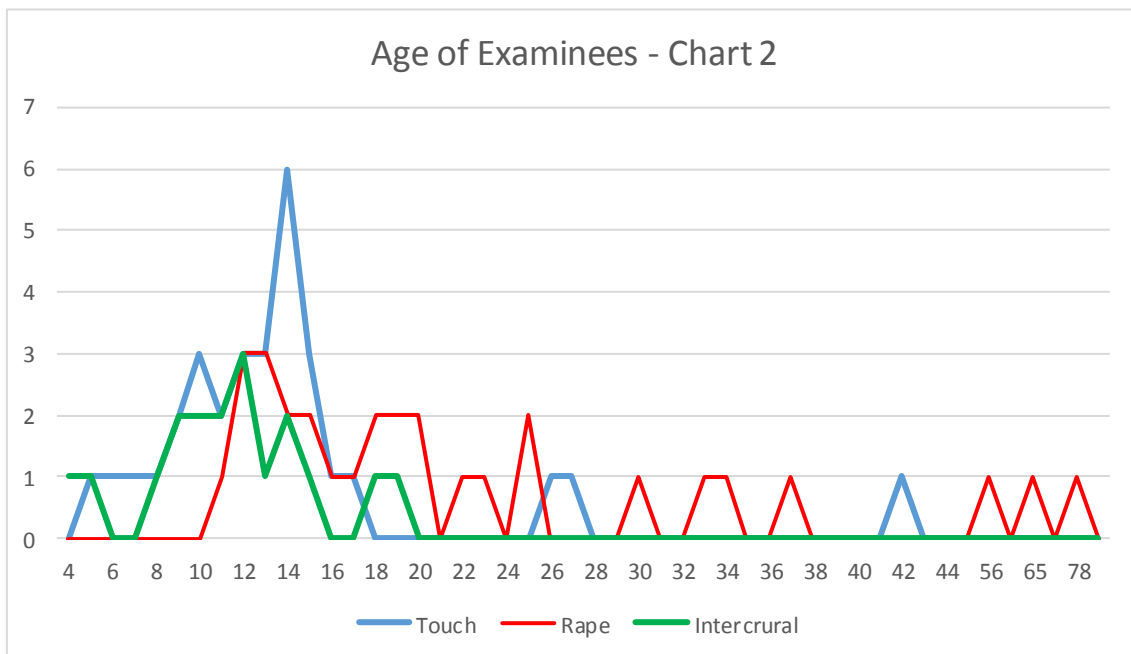
RESULTS

Eleven different categories were identified among alleged sexual assault cases according to the main complaint of the victims. They are: (1) Eloped with boyfriend before the age of 16 years (age for consenting sex)- 108, (2) Consenting sexual intercourse – 41, (3) Fondling/ Touching – 31, (4) Alleged rape and attempted rape (nonconsensual sexual intercourse)- 30, (5) Intercrural intercourse (thigh intercourse)- 18, (6) Anal intercourse- 5, (7) Verbal abuse- 5, (8) Abduction- (parents suspected sexual assault)- 3, (9) Fingering-1, (10) Exhibition of genitalia- 1, (11) Naked photographs were taken after intercrural intercourse-1.

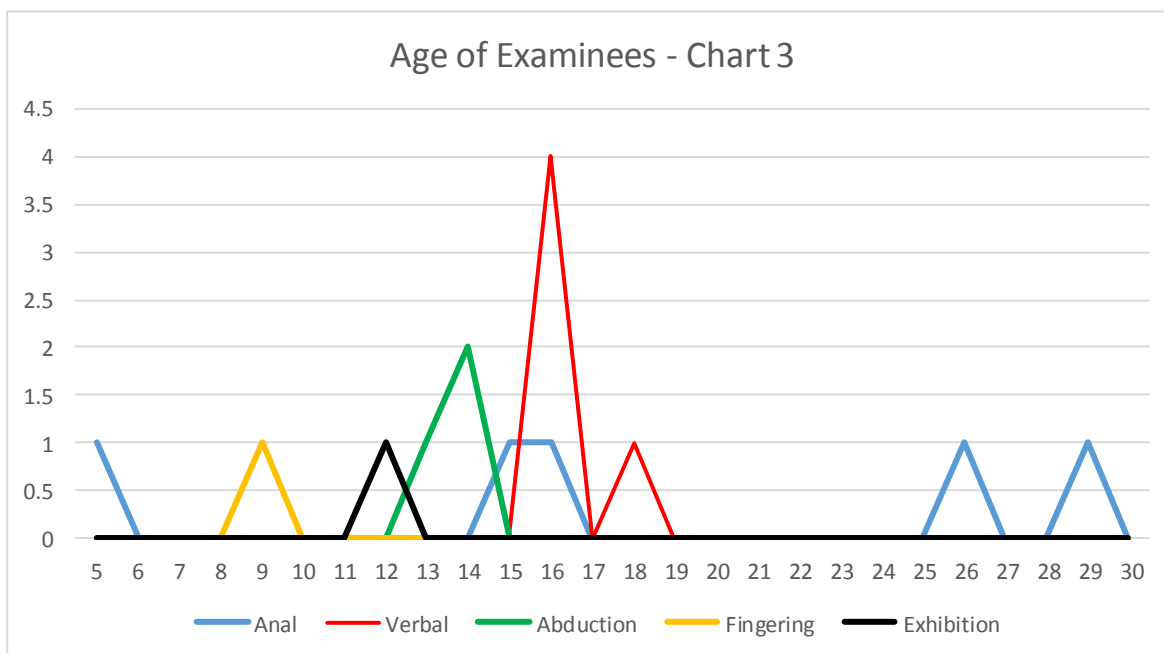
Different ages of victims of elope and consensual sexual intercourse groups



Different ages of victims of touch, rape and intercrural intercourse groups



Different ages of victims of anal abuse, verbal abuse, abduction, fingering and exhibition groups



Injury pattern at the time of examination

- (1) Eloped with boyfriend before the age of 16 years.
No bodily injuries were found in any case.

Findings of Genital Examination with the number of cases

Type of Findings	No. of cases
No history of sexual intercourse and no genital injuries	12
History of sexual intercourse present but no genital injuries	16
Attenuation of hymen	11
Large hymeneal orifice (two adult finger size)	11
Fimbriated hymen	12
Contusion at 6 o'clock position of vulva	01
Hymeneal gap between 5 and 7 o'clock position of hymen	02
Partial hymeneal tears at 3 and 6 o'clock positions	01
Complete hymeneal tears	52

Sites of 52 complete hymeneal tears with number of cases

No. Hymeneal Tears	Site of tears	No. of cases
Single Hymeneal Tear	6 o'clock position	28
	7 o'clock position	05
	5 o'clock position	03
	3 o'clock position	01
Two Hymeneal Tears	4 and 7 o'clock positions	03
	5 and 7 o'clock positions	03
	6 and 7 o'clock positions	02
	5 and 6 o'clock positions	01
	3 and 6 o'clock positions	01
	4 and 6 o'clock positions	01
	6 and 8 o'clock positions	01
	4 and 8 o'clock positions	01
	5 and 8 o'clock positions	01
Four Hymeneal Tears	3, 6, 7 and 9 o'clock positions	01

(2) Consensual sexual Intercourse

Consensual sexual intercourse was the complaint of 41 victims. Thirty four (34) were below 16 years and were produced under the law of statutory rape. Two of them were pregnant. Out of 7 adult females, 5 filed complaints at the police station because of the refusal of marriage by boyfriends after engaging in consensual sexual intercourse and two of them were referred by clinicians following ingestion of poisons due to refusal of marriage.

Bodily injuries were not seen in this group.

Findings of Genital Examination with the number of cases

Injury Pattern	No. of cases
Complete hymeneal tears	28
Large hymeneal orifice more than 2 adult fingers	04
No hymeneal tears with hymeneal orifice one adult finger size	03
Attenuated hymen	05
Contusion of 6 o'clock position of vulva without hymeneal tears	01

Site of hymeneal tears with number of cases

No. of hymeneal tears	Site of tear	No. of cases
Single hymeneal tears	6 o'clock position	23
	3 o'clock position	01
	7 o'clock position	01
	8 o'clock position	01
Two hymeneal tears	4 and 6 o'clock positions	01
Four hymeneal tears	3, 6, 7 and 8 o'clock positions	01

(3) Fondling and Touch – No injuries were found

(4) Rape and attempted rape

Genital Findings		No. of cases
No genital injuries		08
Attenuated hymen		05
Large hymeneal orifice		01
Healed hymeneal tear at 6 o'clock position and contusion at 3 o'clock position		01
victim has married after the incident		01
history of childbirth after incident and hymeneal gap between 3-9 o'clock positions		01
Single Hymeneal Tear	6 o'clock position	01
	7 o'clock position	02
	3 o'clock position	01
	5 o'clock position	01
Two hymeneal tears	5 and 7 o'clock positions	01

Bodily injuries were seen in 5 cases of alleged attempted rape. They were married women.

Site of bodily injuries with the number of cases

Sites of bodily injures	No. of cases
Contusion on right forearm, abrasion on right side of neck and on left forearm.	01
Contusion on right side of head, abrasions on left side of chest, back, right thigh, right lower leg, left ankle	01
Two finger nail abrasions on left side of neck, bite mark on right breast, abrasion on right shoulder, 5 finger nail abrasions on right upper arm, abrasion on back of right elbow, on left upper arm, on back of right hand, on right thigh, on right knee, on left lower leg and contusion on right side of head	01
Two contusions of neck	01
Contusion on left side of chin, two abrasions on neck and an abrasion on lower leg.	01

(5) Intercrural intercourse (thigh intercourse)- No injuries found

(6) Anal intercourse- no bodily injuries were found. Some cases showed anal tears.

Different findings of the anus with number of cases

Injury Pattern		No. of cases
No injuries		02
Anal tears	Single tear at 6 o'clock position	01
	Single tear at 12 o'clock position	01
	Three tears at 12, 2 and 6 o'clock positions	01

- (7) Verbal abuse- No physical injuries expected and none found.
- (8) Abduction- Even though parents suspected sexual assaults, boyfriends had abducted girls there was no history of sex. No injuries were found on the body or genitalia.
- (9) Fingering-Complete hymeneal tear at 12 o'clock position
- (10) Exhibition of genitalia- no injuries expected and no injuries found

DISCUSSION

Anuradhapura district is considered as a district common for sexual assaults¹. Sexual assault is any involuntary sexual act in which a person is coerced or physically forced to engage against their will, or any non-consensual sexual touching of a person. Sexual assault is a form of sexual violence, and it includes penetration (such as forced vaginal, anal or oral penetration or drug facilitated sexual assault), groping, forced kissing, child sexual abuse, incest, torture of the person in a sexual manner and sexual harassments (verbal or physical conduct of a sexual nature that affects an individual's work or school performance).

But in this article, cases are discussed according to the main complaint of the victim in medico-legal viewpoint. According to the complaints of the victims, eleven different categories were found among alleged sexual assault cases of females- (1) Eloped with boyfriend before the age of 16 years-/age for consenting sex-45%, (2) Consenting vaginal intercourse with underage girls and subsequently refusal of marriage-18%, (3) Fondling/ Touching – 13% (4) Alleged rape and attempted rape-13% (5) Intercrural intercourse (thigh intercourse)-.4%, (6) Anal intercourse-2%, (7) Sexual verbal abuse- 2%, (8) Abduction-1.5%, (9) Fingering-0.5%, (10) Exhibition of genitalia-0.5%, (11) Naked photographs were taken after intercrural intercourse-0.5%.

In many jurisdictions, the term 'sexual penetration' is being used instead of 'sexual intercourse'. Sexual penetration includes sexual intercourse, anal intercourse,

cunnilingus, fellatio or any other intrusions involving any part of a human body or of any object into the genital or anal opening of a person's body². But in this study, sexual intercourse, anal intercourse, oral intercourse and fingering are separately discussed because in Sri Lanka the term "sexual penetration" is not in use. Sexual intercourse (vaginal intercourse) without valid consent is punished under law of rape and all other penetrations are punished under "grave sexual abuse". Twenty percent (20%) of cases consist of non penetrative sexual activities like intercrural intercourse, fondling, exhibition of genitalia and verbal abuse.

Even though cases were categorized in to 11 groups according to the main complaints, they belong to different legal and psychosocial groups. Cases of intimate partner violence are presented as refusal of marriage after consensual sexual intercourse and anal intercourse. Child sexual abuse³ cases were presented under all complaints and became the majority 91.7% (223 cases). Sexual assault in workplace is another emerging problem in the world⁴, and one case is found in this study.

Sexual harassment is another interesting topic under discussion in developed countries. Sexual harassment is intimidation, bullying or coercion of a sexual nature, or the unwelcome or inappropriate promise of rewards in exchange for sexual favors. Verbal Sexual harassment was found in the study.

Age of the victims

During the year 2014, females between the ages of 4 years and 78 years were sexually assaulted in Anuradapura district. The age range varies with different sexual assaults. Participation in eloping is seen in females between the ages of 12 and 17 years with the maximum number at 15. Consenting sexual intercourse is seen between 12 and 32 years with the maximum number at 15. Females under 16 years were produced for medico-legal examination because engaging in sexual activity is a statutory crime due to absence of legally valid consent. Females above 16 were reported because their boyfriends refused to marry them. Two girls were reported by clinicians because they ingested poison to commit suicide. Fondling and touching were reported between 5 and 42 years with maximum cases at 14. Alleged rape and attempted rape cases are reported between 11 and 78 years with maximum numbers at 13 and 14 years. Intercrural intercourse cases are reported between 4 and 19 years with maximum number at 14 years. Anal intercourse is reported between 5 and 29 years. Sexual verbal abuse is seen at the ages of 16 years and 18 years, maximum being at the age of 16 years. Abduction is not a sexual assault but victims were produced for medico-legal examination to eliminate suspicion of any sexual assault because parents were suspicious of vaginal intercourse. Victims were 13 and 14 years old with the maximum number at 14. Only case of fingering reported was of a 9 year old, the exhibition case was of a 12 year old and the naked photographs taken was of a 11 year old.

Elderly sexual assault is considered as victimization of persons over the age of 60;- Most of whom suffer from decreased functionality, frailty, and weakness and therefore are reliant on caretakers. Only a small percentage of elderly victims report it to the police. Physical signs that an elder is being sexually assaulted include increased vaginal tearing, bleeding, bruising, infection, pelvic injury, soft tissue or bone injury. In this study, out of 30 alleged rape/

attempted rape victims two were elderly women (6.6%).

Teenage elope and consensual sexual intercourse is very common in Anuradapura district and it leads to pregnancy, criminal abortions and suicides⁵. This study shows hundred and forty two (142, 52.5%) of such cases during the year with two attempted suicides. Since 43% of all cases had been medico-legally examined by a senior medico legal officer, it is rational to strengthen clinical forensic medicine subspecialty in Sri Lanka and appoint such specialists to stations where more clinical cases are medico-legally managed.

Injury patterns of different complains

In the examinees for Fondling / touching, intercrural intercourse, verbal abuse, abduction and exhibition, no physical injuries were expected and none were found. But theoretically, redness of the skin is a possibility. Medico-legal examination soon after assault and devices to detect deep skin contusions are the improvements needed to develop medical evidence. Intercrural intercourse⁶ is discussed in medical literature mainly in relation to small children. Four percent (4%) of cases of intercrural intercourse in this study group, mainly in post puberty girls in Sri Lanka, may be due to the cultural reasons such as respect for the virginity.

In elope and consensual sexual intercourse groups, hymeneal tears were the only findings except in one case which showed a vulval contusion at 6 o'clock position without hymeneal tear. Single hymeneal tear is the commonest type of genital finding and it is commonly situated at 6 o'clock position. When there are two hymeneal tears they were not symmetrically distributed around 6 o'clock position as 5 and 7 or 4 and 8, instead they were found at 4 and 7, 6 and 7, 5 and 7, 3 and 6, 8 and 5 o'clock positions. In the elope group, there are cases where history of sexual intercourse is available but hymeneal tears were absent. This situation is possible due to two

reasons;-Either the victim had recognized non penetrative intercrual intercourse as sexual intercourse or false history was produced to get the parental permission for marriage.

Attenuated hymen is an important finding indicating repeated vaginal penetration⁷. Large hymeneal orifice (two adult fingers size) without hymeneal tears is a practical challenge for the forensic medicine practitioner to express an opinion about vaginal penetration. In high court trials, lawyers expect to differentiate congenitally large hymeneal orifice and large hymeneal orifice due to previous sexual intercourse. Therefore, "large hymeneal orifice" needs further research to identify causes.

Injury pattern at the time of examination depends on the time duration between sexual assault and medical examination, force applied, resistance of the victim and local condition of the vagina⁸. Commonest finding is the complete hymeneal tear. Partial hymeneal tear was found only in one case indicating it as an uncommon finding in sex assaults. Minor vaginal tears are expected in recent vaginal intercourse;- Hence, Sri Lankan forensic medicine practitioners need to start finding minor tears of vagina with the help of colposcopy⁹. As the result of continuous training programs, police officers promptly produce sex assault victims to the forensic medicine practitioners. On the other hand, victims present themselves to the police after a considerable delay. Therefore, public awareness programs can improve the situation.

In the victims of rape and attempted rape, commonest genital finding was the healed hymeneal tears due to previous consensual sexual intercourse. Even though lawyers and general public expect to find bodily injuries in rape and attempted rape victims, injuries were found only in 16.6 % (5 adult victims out of 30) cases. Absence of injuries could be due to surrender with fear, injury disappearance with time or false complaints. During the history taking from

the victims, more attention is required to find the reasons for not sustaining injuries. Absence of injuries should not be used to suggest consent for sex or to exclude the history of the victim in court trails. None of the children had bodily injuries. It confirms that sexual child abuse is not associated with physical child abuse.

Three victims of anal intercourse (60%) had anal tears. During history taking, it is important to obtain details about penetration of penis through anus. Moving the penis between buttocks from behind is also identified as anal intercourse by teenagers. The fingering case showed a hymeneal tear at 12 o'clock position. It was not in accordance with the common expectation of hymeneal tear around 3 or 9 o'clock position with foreign body penetration such as a finger.

CONCLUSION

Females between the ages of 4 years and 78 years had been subjected to sexual assaults in Anuradapura district during the year 2014. Eloping with the boyfriend was the commonest presentation (40%). Statutory rape identified in the study as elope and consensual sexual intercourse before the age of 16 years (52.5%), was the major criminal offence among alleged sexual assaults in Anuradapura district.

Females between the ages of 11 years and 78 years were subjected to alleged rape or attempted rape with the maximum cases at the age of 13 and 14 years. Bodily injuries were seen only in 5 cases of alleged attempted rape category out of two hundred and seventy (270) alleged sex assaults. Absence of injuries cannot be used to suggest consent for sex or to exclude the history of the victim in court trails.

Awareness programs to encourage victims to report to police soon after sexual assault, clinical forensic medicine specialists for major medico-legal units and devices to detect deep skin contusions are the improvements needed.

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CHRONOLOGICAL AGES AND THEIR IMPORTANCE TO LAW AND FORENSIC PRACTICE IN SRI LANKA

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ABSTRACT

Age of a person is an important parameter in forensic practice both in the living and in the dead. This paper attempts to identify different chronological ages that are relevant to forensic contexts in our domestic law. As per the Sri Lankan law, ages eight, twelve, sixteen, fourteen, eighteen and twenty one are critically important when there is a dispute about the age or information regarding the age of a person in these age categories are missing.

Key words: Chronological age, Age estimation, Age and law

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INTRODUCTION

Age of a person is an important parameter in forensic practice both in the living and in the dead. Age of a person can be useful in identifying a person, incriminating a suspect and also for exonerating a suspect in a forensic/legal context. Providing an estimation of the age of a person is a common activity in forensic practice. This is more common where the identity of the person is not known especially in instances where the body is decomposed, burnt or fragmented. Certainly the age estimation of the living is also not uncommon in forensic contexts.

Despite the importance of age in forensic practice, many are unaware as to the law regarding which ages could be important in

forensic contexts. Of course common instances like age limit for consent for sex is widely known but there are other laws that require the estimation of age in a forensic context which many seem to ignore. Therefore, this paper attempts to identify different chronological ages that are relevant to forensic contexts in our domestic law.

Chronological Age and Biological Age

Chronological age refers to the actual time in years and months a person has been alive. This means the truth of the person's age. While birth certificates and passports are good documentary evidence to establish one's chronological age, there have been many instances where these documents have been forged or altered. In other instances, these documents are lost, destroyed or not prepared due to many reasons. In criminal instances, when age is a mitigating factor or an incriminating factor some accused have reportedly destroyed their documentary evidence of chronological age.

Biological age in contrast is 'how old does he or she seem' taking into consideration his or her biological parameters. Certainly this is an estimate. What is estimated in a forensic context is the biological age. The actual age or the chronological age of the person is not known to the forensic practitioner and the age of the suspect/victim is estimated using different types of biological data from the particular victim/suspect.

Two very important assumptions are made here which many tend to ignore. First

assumption made is that the biological age and chronological ages are exactly the same or nearly the same. The second assumption is that biologically age of a person can be scientifically estimated to a point estimate – meaning that the age of a person could be given as a year month and date. The truth is far from this. In other words, the biological age that is estimated is merely a statistical estimate which means that there is a standard error, a confidence interval and a standard deviation. In other words it is not possible for the forensic practitioner to provide an exact date of birth for the individual, nor he/she can provide at least an year with one hundred percent accuracy. What can be done is to provide with a rough estimate giving a possible age range. However, the legal fraternity and police expect that the forensic practitioner provides a point estimate of the age of the individual. Of course, this has valid reasons. The law technically says if someone is above a certain age a certain action will or will not apply. For example, in order to decide on a statutory rape when the consent of the woman is not contested, the age of the woman is very important – if the woman is above 16 years of age then, there is no statutory rape when consent of the woman has been legally valid. As a consequence, determining the age (when it is unknown) of the woman whether it is 16 or above is technically very important to the court. However, what must be understood by the legal fraternity is that the forensic practitioner provides the opinion based on biological development parameters of the person which may show similar signs between a range of ages.

Age Determination – The Scientific Approach

Generally when a person is referred for age estimation, a physical examination which includes records of external features, anthropometric data, signs of sexual maturation and any age related development disorder are recorded. Despite their subjectivity and vagueness, these parameters are still important primary

information. Then generally a radiographic examination of bone maturation will be assessed and the left hand is routinely used if the suspect/victim is a young adult. Then most importantly the dental development and age related information in the mouth are recorded clinically as well as using radiological methods. Certainly, the history provided by the victim/suspect is also relevant but the practitioner always bases his/her opinion on the scientific evidence that is available. Evidently, psychological maturity of the person has also been used at many instances however its use in forensic contexts especially in determining the chronological age has been debated. In post mortem situations fusions of cranial sutures, fusions of other long bones, age changes in symphysis pubis, age changes in ribs, amino acid racemisations have been useful, in addition to the above clinical and radiological approaches.

Limits of Scientific approach

Physical characteristics of individuals can vary depending on many factors. For example nutritional factors, genetic factors, environmental factors can influence the growth and development of physical features of an individual. An equally significant aspect to consider is whether the individual is suffering from any condition that affects his/development which are known as developmental disorders.

Given the high reliability the law places on the opinion of the forensic practitioner on his/her age estimation report, it is relevant to mention that most of the time, the physical features or radiological characteristics are based on contrasting what is seen clinically or radiologically on the victim/suspect and what characteristics are already established through research that should be seen at certain age intervals. For example, clinically, if pubic hair is seen in the individual then the research has predicted the age of the individual (depending on the gender) a certain age range while there are established age ranges for the appearance and fusion of bones in wrist/hand.

Notwithstanding such wide usage of these approaches in estimating ages, we in Sri Lanka rely heavily on published western data. Noting the compelling evidence to suggest that there is significant variations of ages in these physical parameters depending on their genetic or ethnic origin, it is questionable as to how reliable would the estimate be for a Sri Lankan. If at all, there are only a few studies that are published using Sri Lankan participants - however they have their own scientific limits. For example, the sample sizes used in Sri Lankan samples have been minimal to extrapolate to a population while there are no reliable information for ethnic groups, socio-economic groups, gender groups etc. On the other hand, as the age progresses from youth to adulthood, the reliability and availability of methods reduces. In this situation accuracy of determining the age of an individual becomes questionable.

Ages and Sri Lankan Law

Having discussed the above context, it is now important to explore and identify what ages are forensically important to consider in our legal system. The most important ages in forensic practice are those that are available in the penal code. In its section 75 ages eight is introduced as the minimum age of criminal liability while the ages between eight and twelve are introduced as *doli incapax*. This means that the ages eight, twelve and in-between are criminally significant when the age is disputed or unavailable. Next important age under the penal code is the age of 16 which is introduced as age of consent for sex for females. This age which is very commonly contested is of very significance in forensic practice in Sri Lanka.

Next important age limit is the age of eighteen due to many reasons. The child rights policy of Sri Lanka recognises a person below 18 years as a child. This age is critical in order to earn many privileges as a child to a person. Further, age of eighteen is considered the minimum age for legal marriage for both male and females in Sri

Lanka under both general law and under Kandyan law. Age of 18 is important again for casting vote at elections, standing for elections, making a legal will, obtaining a driving licence and the like. Most importantly the age of majority in Sri Lanka is eighteen years according to Age of Majority Ordinance.

Moreover, age of twenty one is also important. For example, whether a person will be sent to prison or will be considered as a youthful offender depends on whether the person has reached the age of 21. If the person has not reached 21 years but above sixteen years, he will not be sent to a prison for a criminal conviction but will be sent to a training school for youthful offenders. On the other hand, age 21 is further important in renouncing or applying for citizenship and at age 21 a person ceases receiving maintenance entitlements. Age of 14 becomes important for several reasons. It is the age up to which a child can be adopted, the age for employment in certain industrial settings.

CONCLUSIONS

While estimating age in forensic contexts appears an important endeavour, there are many challenges a forensic practitioner has to overcome in order to predict the best unbiased estimate. Owing to lack of research with adequate samples, most bone and teeth data available are invalidated for local populations. It is questionable as to the accuracy of using European or data from other populations to estimate ages of local populations in Sri Lanka given the research findings of variables that significantly affects biological age.

As per the law, ages eight, twelve, sixteen, fourteen, eighteen and twenty one are critically important when there is a dispute about the age or information regarding the age of a person in these age categories are missing.

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