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CONTENTS

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EMPOWERING "SIGNIFICANT OTHERS" IN FORENSIC MEDICAL PRACTICE IN SRI LANKA

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Forensic Medical Practice is undoubtedly teamwork and involves several important members. Forensic Pathologists, post mortem assistants, laboratory technicians are some key personal in the local set up. In addition to these categories, forensic anthropologists, forensic odontologists, forensic scientists and police involve in medico legal work when required. The Inquirer in to Sudden Deaths is the team leader when it comes to an inquest where an order is issued for an autopsy report, if required. Finally the court, lawyers and relatives get involved in matters connected to the administration of the law.

Medical and dental officers along with other forensic scientists have the opportunity to pursue local and foreign training on their job. However the significant others[1], other than these categories (medical officers, dental surgeons and scientists) unfortunately lack the opportunities for further training in their role in forensic practice. This situation not only reduces the quality of team work and their specific roles in forensic practice but also significantly reduces their self esteem and motivation. The most affected and neglected members of the forensic team in Sri Lanka in respect to formal training are the post mortem labourers and laboratory assistants.

A research carried out by the author among "significant others" in forensic practice in regard to inter alia their job satisfaction, training needs, knowledge and perceptions in regard to medico-legal work, revealed that their knowledge attitude and practices in regard to safe autopsy practice, infection control and possible occupational hazards were not satisfactory. None of them has received any formal or non formal training in any aspect to their job. This situation warranted me to organize a training workshop on "safe autopsy practice" for post mortem labourers and other non clinical staff who involve in medico-legal work. An invitation was extended to the central province staff who involve in medico-legal work and the central province Director of Health Services permitted all post mortem staff in hospitals to attend this workshop.

The participants enjoyed the work shop. There was a pre test in regard to basic knowledge on safe autopsy and a post test that was conducted after the workshop. These two tests revealed that the participants have significantly improved their knowledge and attitude in regard to safe autopsy. The participants were enthusiastic and actively involved in the training program.

The workshop included sessions on safe autopsy procedure, infection control, preventing occupational hazards and ethics and professionalism. The resource persons were from the department of microbiology and the department of forensic medicine faculty of medicine university of Peradeniya.

By analysing the comments the participants made orally at the end of the session and in there written feedback, it is evident that they have never had any training in regard to their work or related to safe autopsy practice. Having empirical scientific evidence to show that there is a risk of cross infections in post mortem handling, it was surprising to note that these participants have never had any such training.

The author believes that these categories of 'significant others' in forensic work in Sri Lanka should be given adequate recognition, training and attention. Such a training and formal recognition of their work not only improve their self esteem but also will up lift work quality, safety and reduce cross infections.

[1]Significant others in forensic practice include postmortem labourers, assistants, lab technicians etc.

INDOOR POSTMORTEM ANIMAL SCAVENGING - A CASE REPORT -

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ABSTRACT

Discovery of decomposed bodies in domestic setting is not an uncommon occurrence. However postmortem animal scavenging of their owner is not commonly reported but can occur when the main predisposing factors are social isolation, living with free pets in the house and a medical condition causing sudden death.

INTRODUCTION

Postmortem animal scavenging is a familiar phenomenon to forensic death investigators. This was first described by Klingelhöffer in 1898. [1]Outdoor postmortem animal scavenger modification is a common finding in corpses exposed to the natural surroundings. However indoor postmortem scavenging is not a common occurrence. The victim almost always has a predisposing cause for sudden death, having been socially isolated and having free moving pets in the house have been identified as main predisposing factors for indoor postmortem animal scavenging.[1-3]

Even though outdoor postmortem animal scavenging is a common occurrence in Sri Lanka, indoor postmortem animal scavenging has not been frequently reported. This may be due to less incidences of social isolation especially among elderly due to the practice of extended families living together and also not having indoor pets. However with the change of the social and cultural life styles, social isolation is now becoming evident especially among older people. According to the Department of Census and Statistics of Sri Lanka the average household was 4.2 persons in 2001 and in 2011 it had decreased to 3.9 persons. Furthermore Sri Lanka has one of the fastest ageing populations in the world. The population of 60 years and above was 9% in 2000 but had increased to 11% in September 2010. The old age dependency ration for year 2012 was 19.8%. [4]

The personal experience of the authors are that more and more people prefer to have indoor animals as companions now than they had years ago. Thus it is safer to believe that there is an increase in the number of older people living alone and having indoor animals as companions.

In domestic surroundings pets and rodents who has access to the corpse can cause drastic postmortem damages. Thus postmortem scavenging is a potential source of puzzling marks for forensic pathologists and investigators when unveiling criminal activity.[2,3,5] In cases where there is indoor postmortem scavenging the cause of the death can be either natural, suicidal or accidental.[2] However to arrive at a definitive conclusion of the animal responsible for postmortem scavenging, careful examination of the scene where the body was recovered from and through examination of the external injuries on the corpse is of paramount important.

This article present a case of indoor postmortem scavenging by pet dogs on a female aged 76 yrs whose body was recovered after 3 days of her death.

CASE HISTORY

A 76 year old female was found dead in her house lying supine on the bed and the chest was covered with a T-shirt and the lower part of the body was exposed. The right foot was resting on the floor. The arms were spread out and the head was resting on a pillow [Fig. 01]. There was no sign of a struggle. The T-shirt had 3 tear marks and the piece of cotton cloth was found on the floor which was extensively torn and it

was believed that this material had been used to cover the lower part of her body.

The house was in a state of disorder with garbage everywhere [Fig. 02]. There was hardly any blood at the scene and on the clothing except few dried-up patches on the T-shirt. There was no signs of struggle and the house was locked from inside. At the time of the recovery of the body 15 dogs were living free inside the house including 4 puppies and 4 medium sized male dogs. All of them had been kept inside the house by the deceased and were thought to rescue stray dogs which had not been properly trained as pets. The woman was last seen alive by her son 11 days before and by the neighbours 04 days before. According to the son of the deceased she has been living alone and was suffering from diabetes for a long time for which she was on oral medication. As the cause of the death was not known forensic autopsy was conducted on the order issued by the magistrate.

The body was in a badly putrefied status and the head was partly skeletonized. The upper partial acrylic denture was in place [Fig. 03]. The left hand was missing up to the elbow and the humerus was exposed [Fig. 04]. Toes of both the right and left feet were missing and the metatarsal bones on the right leg were exposed [Fig. 05]. The autopsy revealed no fractures in the head. The soft tissue defects showed no slashing of tissues. The wound edges on the right leg revealed small parallel partially curved superficial notch marks suggestive of bite wound. There was a single puncture wound next to the soft tissue defect in the right leg [Fig. 06] and it can be attributed to a canine imprint of a dog. According to the postmortem changes the time between the death and the recovery of the body was about 4-6 days.

Histological examination of the wound edges showed no obvious vital reaction. Toxicological analysis of the blood showed no significant alcohol levels or any other toxic substances.

However, examination of stomach contents of the dogs or saliva swabs from the wound edges for DNA analysis were not considered taking into the account the number of animals that were involved and the time since death.

According to the autopsy and histological findings the cause of the death was recognized as complications of Diabetis Mellitus. In considering the death scene investigations, autopsy and forensic odontological examinations it was concluded that the injuries found on the body of the 76 year old woman had to be caused postmortem by the dogs found at the scene.

DISCUSSION

Pets as well as animals such as rodents who have access to the house can be responsible for indoor postmortem scavenging. The most common pet animals of indoor postmortem scavenging are dogs and cats however small animals such as birds[6] and hamsters[3] have also been reported of showing similar behavior patterns.

Frequently the face, hands and legs are destroyed by postmortem animal interference as they are unclothed and thus easily accessible.[2] However there are cases where such lesions having been noted in other areas of the body which have been covered by the cloths[7] including genitals[8] but they are rare.

In cases of postmortem animal scavenging extensive soft tissue defects with notched/ crenated wound edges without signs of vitality have been noticed. In canine attacks, the characteristic feature is a "v" shaped or rhomboid punctured stabs adjacent to mutilations [1, 9] whereas in rodent attacks injuries have a circular crater like hollow defect with distinct parallel cutaneous lacerations in the margins of damaged skin. The crater like injuries are mainly due to the fact that rodents continue to gnawing on a certain spot until they reach a robust structure such as bone, tendon or ligament. The injury margins are finely scalloped and serrated.[9, 10] It is also common to find linear scratch abrasions from claws, in the location of the injury.[1, 9] This is in contrast to postmortem scavenging in cases of dogs attacking humans with an intension of killing thereby showing tearing and slashing of tissue.[11] Thus the identification of the animals that caused the injuries is made mainly on the basis of the pattern of the injuries.

It is being suggested that the hunger or non-availability of any substance to pacify the animal's hunger is the primary cause of this

behaviour of the animal.[1, 2] However, this is seen only in very few cases.[6] Even in the presence of plenty of food in the near proximity, indoor postmortem mutilation by pets has been noted.[12, 13] Furthermore such activities have been noted even within a very short period of time after death.[13] These reasons clearly show that the only reason for such behavior by the animal is not hunger or lack of food in the proximity. The other reasons for such behaviour are associated to the psychological state of the animal. A pet noticing his master being in an unconscious state will try to help by licking or nudging, failing to produce any positive results the behavior of the animal can become more fanatic and could lead to biting.[13] This kind of behaviors is known as "displacement" which is motivated by confusion and fear. Furthermore dogs have been noted for sniffing around the region of mouth and nose in recumbent bodies.[2] Animals being locked in a confined space (house/room) can also lead to aggressive behavior which in turn cause postmortem mutilation. In addition, this mutilation by pets might be due to sudden aggressive behavior of the pet toward its owner at a moment of his weakness. In certain instances, it could be due to the abnormal behavior of the animal which is rear in trained domesticated animals.[3] However there aren't any reported cases with a preceding violent offence against the deceases prior to indoor postmortem animal interference.[1] Clothing, drugs and alcohol, diseases and perimortem trauma has been listed as some of the mitigating intrinsic factors that may have an impact on the animal responsible.[2]

The time when animal scavenging begins can vary depending on the origin of the animal behavior. There are reported cases where animal scavenging by pets have occurred within the first 45 minutes of the death of the person.[13] If the animals are being locked up, the extent of the scavenging can be to a degree of complete consumption of the soft tissues leaving the bones. In such situation it has been noted that feeding typically begins at the face and then moves down the body. The trunk is the last body part to be disarticulated and consumed.[14] Therefore shorter time gap can be attributed towards the "displacement" behavior of the animal while the longer time gap can be attributed to the animal being hungry in a locked up environment.

If the body has been scavenged up to the bones, tooth marks can be found on the bones.[2] Bloodless injuries are usually indicative of postmortem injuries, except when advanced decomposition makes such determination questionable or impossible. To differentiate the injuries from antemortem injuries the edges of the injuries can be analyzed for the levels of histamine serotonin[15] and cathepsins[16]. Postmortem injuries show low levels of these inflammatory mediators and enzymes. However in cases of advance putrefaction and mummification such investigations will be futile. For the same reasons the classical features of the tissue edges of scavenging injuries may not be clearly visible in most of the instances. Examination of the stomach contents of the suspected animal/s[3] and Saliva DNA typing of the swabs from the wound edges may sometimes help in assigning the responsible animal.[2,17] Therefore circumstantial evidence play an important role in identifying postmortem animal scavenging.

Three main predisposing factors for postmortem animal scavenging have been identified i.e. victim having a predisposing cause of sudden death, social isolation and having free moving pets in the house.[1-3] In temperate countries such incidence seems to occur more during winter where the degree of social isolation and the death rate due to natural causes are high.[2]

In cases of postmortem animal interference the damages are primarily caused to the exposed areas of the body. In such cases, despite the large tissue defects, the amount of blood at the scene is small or absent. Paw prints; blood stains; animal feces at the scene; pets having easy access to the corpses in the house and presence of rodents nests in the close vicinity are few other findings that have been reported in cases of indoor animal scavenging.[1, 2, 9, 13]

Therefore during investigations of deaths which are suspected to have been occurred indoor and have injuries to the exposed area of the body, a special notes of the factors such as presence/absence of self-defense injuries on the deceased body, amount of blood present in the scene, presence of paw prints deriving from animal's paws, accessibility to the pets/ wild animals, presence of rodent nests in the immediate surroundings must be made while

taking a detailed assessment of the scene of the questioned case.

Cases of long delays in the discovery of bodies in houses often receive extensive media coverage by revealing to the public the sadness of the circumstances that have prevailed around the person's life that may sometimes cause social stigma to the surviving family members especially in the eastern cultures. However it is important to note that factors such as mental and physical illnesses or disabilities, drug and alcohol addiction, trauma from previous abuse may contribute towards social isolation.[18]

On the other hand modern convenience such as internet and telephone banking, automated payment systems[19] online shopping, e-mails and e-newspapers can also eliminate the need for physical interaction with others. However it is important to note that the rise in the ratio of old people in the population with deficient family infrastructure and missing of the neighborly relationships have created an environment that is more prone for old people to die at home and for long delays to occur in discovering the bodies. Therefore, in time to come it may be necessary to implement a system of having welfare checks on elderly living alone by relevant authorities.

Figure. 01: *Status of the body*

Figure 2: *Upper Acrylic Denture in place*

Figure 3: *Left Arm*

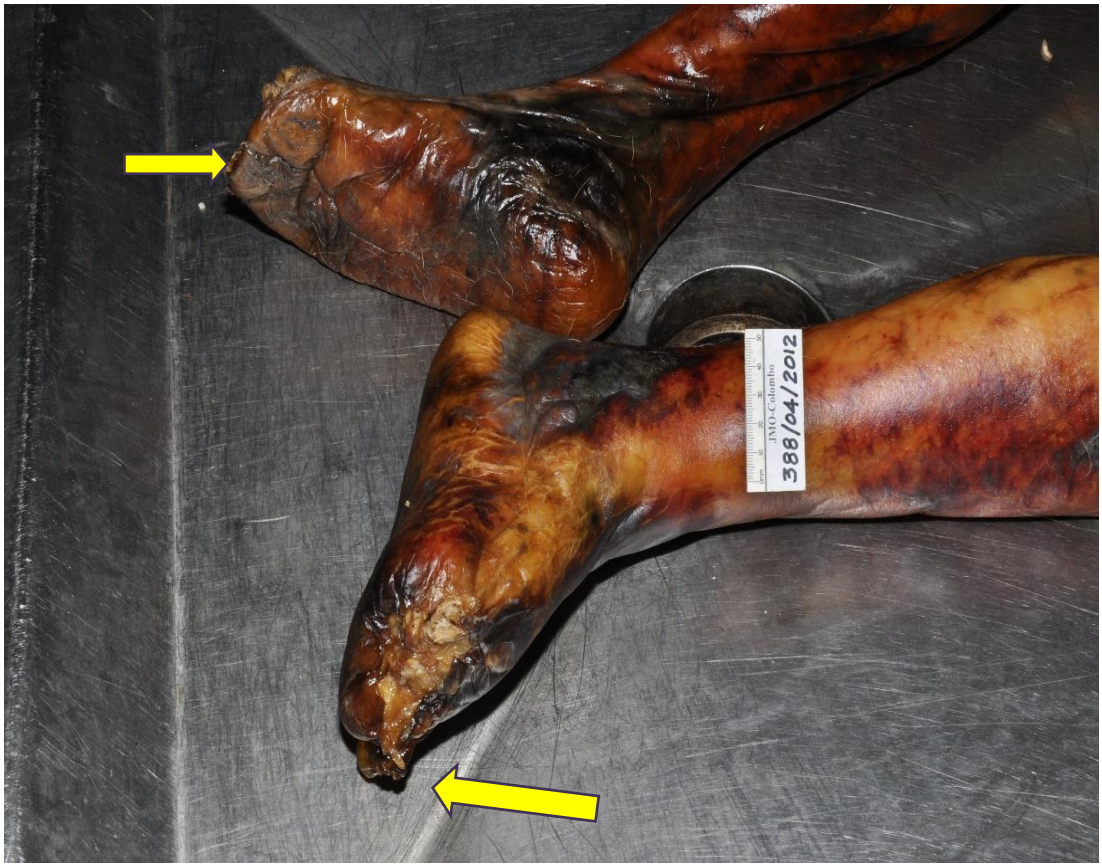

Figure 4: *Left and right feet*

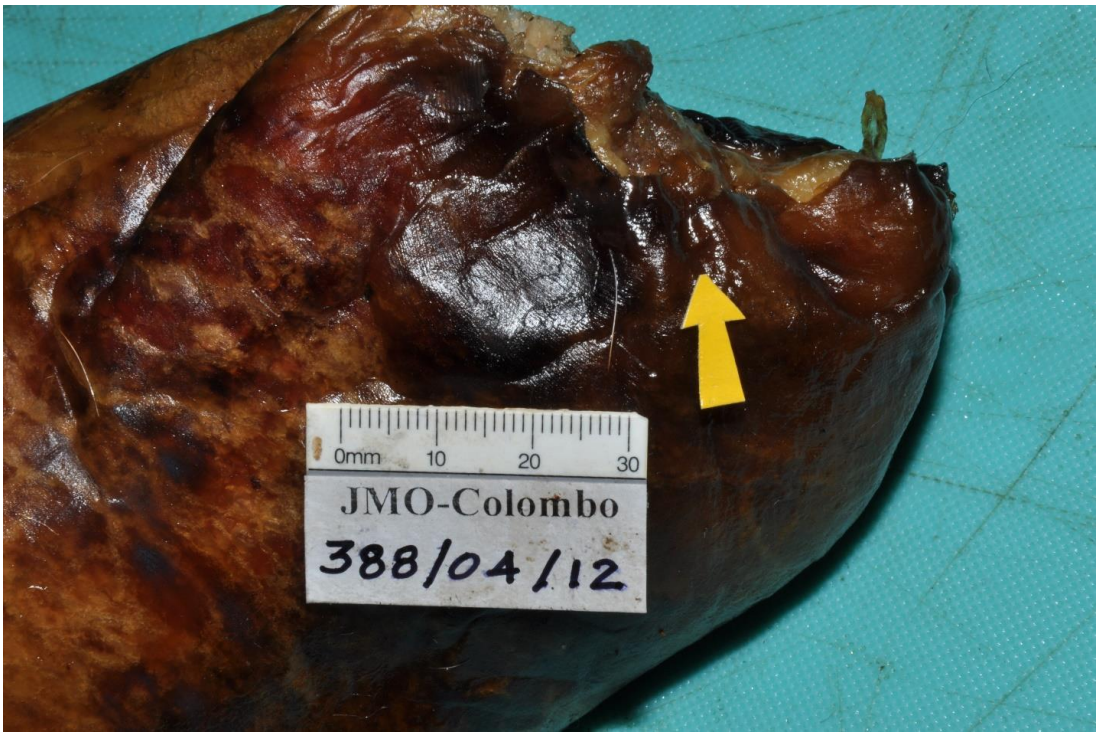

Figure 5: *Puncture wound*

Figure 6: *Scene where the body was recovered from*

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BEYOND AUTOPSIES: TREADING NEW HORIZONS

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INTRODUCTION

The brunt of the Medico-legal work in Sri Lanka is carried out by the Judicial Medical Officers (JMO) attached to the Ministry of Health and Senior Academics attached to the Departments of Forensic Medicine in State Universities. They are mainly involved in conducting judicial autopsies and examining clinical forensic cases. The many branches of Medicine are continuously evolving. Forensic Medicine is no exception. This unique branch had to evolve to meet the current demands from the general public, colleagues from the same profession and other professionals who are directly and indirectly connected to medico-legal work. A proper vision towards the 21st century would reap the fruits of success in the near feature. The achievements yet to come need the support of all relevant authorities. Discussed below are some points to ponder.

DISCUSSION

The forensic autopsies usually end with the issuance of the cause of death. A professional conversation between the forensic pathologist and the relatives of the deceased regarding the important issues pertaining to the death seldom occurs. In certain instances the relatives are so desperate to get proper information regarding their beloved one's death. Nowadays most of the individuals have life insurance policies. There are deaths where the family members had to be mandatorily screened for infectious and genetic disorders. The authors feel there is some room for accommodating these concerns within the accepted legal frame work. One suggestion is the novel idea of conducting medico-legal clinics at regular intervals to address the above mentioned issues. These clinics would be a recognized official platform where the general public could address their problems. Let us further elaborate the values of a medico-legal clinic and the possible services it can provide to the public.

1.1 Composition of a medico-legal clinic

As for any other clinic, a day in a week is allocated. In case of teaching hospitals a separate day for the University unit is advisable. The medico-legal clinic would be lead by a specialist in Forensic Medicine where the other staff include registrars in Forensic Medicine and Medical officer- Medico legal (MO-ML). In the support staff category, the medico-legal clinics would desperately need the services of a "*Forensic Nurse"*. The Forensic Nurse is also a new entity from the Sri Lankan forensic perspective. The other minor staff can be mobilized from the Judicial Medical Officer's work force.

1.2 Some services rendered at a medico-legal clinic

a. Issuance of medico-legal reports for insurance/civil purposes
b. Referring family members to exclude infectious diseases, genetic disorders etc.
c. Providing information to the relatives within legal limits considering the sensitivity of such information, both in clinical cases as well as in the autopsies
d. Attending clinical cases with medico-legal issues referred from different wards/nearby small hospitals
e. Finding solutions/clinico-pathologic explanations and providing feed backs pertaining to hospital deaths as long as such information is solicited by the clinicians
f. Follow up of clinical forensic cases
g. Maintaining appropriate registers for reference purposes

1.3 The desired outcomes of a medico-legal clinic

a. Medico-legal services are made available to the general public with minimal hassle.

b. A better collaboration with proper understanding among professionals involved in clinical work
c. An accepted method of stream lining the medico-legal services

Another important link to the forensic specialist with regard to clinical forensic cases is the Forensic Nurse. This is again something new to the Sri Lankan forensic arena. A Forensic Nurse is someone who is specially trained to handle clinical forensic cases. Let us explore how a forensic nurse can be of value.

2.1 Identified duties of a forensic nurse (Sri Lankan context)

The recruited person is ideally of female gender and be an equivalent of ward sister. She would be in charge of all administrative matters and relevant clinical examinations under the supervision of the Judicial Medical Officer. She would also play a key role in administering the medico-legal clinics. The maintaining of all relevant registers would also come under the purview of the forensic nurse. She would also supervise the minor staff and be answerable to the Consultant JMO. She would be in a better position to "prepare" clinical forensic "cases" for examination (including overall psychological preparation of victims of sexual assaults for clinical examination and obtaining samples) and obtaining the so called "informed consent".[1, 2, 3, 4]

2.2 Necessity of a Forensic Nurse

A Forensic Nurse would further strengthen the existing system with better collaboration and support to the other stake holders in the profession. She would act as an important link in providing necessary information and required services such as in organizing institutional case conferences in physical child abuse.

2.3 Training and cadre position of a Forensic nurse

There is no currently existing training programme or an identified cadre position for a forensic nurse. The respective university departments can make available a postgraduate diploma course of one year for those who are qualified as nurses and wish to pursue a career as forensic nurse. Suitable cadre positions have to be created in accordance with the ministry of health requirements.

The next important player in providing medico-legal service is the Forensic Pathologists' Assistant. Here again no specific designation exists as such at present in Sri Lanka. This category of support staff needs further training and recognition. The currently existing mortuary minor staff provides exemplary services to the general public but it may go unnoticed. Let us explore the ways and means by which a pathologists' assistant can be helpful to the medico- legal work.

Since the forensic pathologists indulge in both clinical work and autopsies the scope of the pathologists' assistant work can be broadened. He could be of great help to the forensic pathologist in carrying out his work more preciously, meticulously and in a less cumbersome manner.[5, 6, 7]

3.1 Duties of Forensic Pathologists' assistant (Sri Lankan context)

a. Assisting forensic pathologists in performing autopsies
b. Obtaining forensic samples both in the morgue as well as in the field
c. Maintaining chain of custody of such samples
d. Forensic photography
e. Blocking of tissue samples for histopathology
f. Administrative work related to autopsies
g. Maintaining the mortuary (mortuary management) including health and safety issues of co-workers and condition of instruments and storage and release of dead bodies
h. Maintaining a link between the staff and already disturbed/bereaved relatives (specially in sensitive cases like SIDS)
i. Assistance in field work (crime scene investigations)
j. Assistance in academic matters, research, conducting practical examinations for doctors and preparation of specimens for teaching purposes
k. Training newly recruited laborers in dissection techniques
l. Assistance in examining clinical forensic cases.

m. Assistance in conducting medico-legal clinics

3.2 Necessity of a Forensic Pathologists' assistant

The quality of work expected from a Forensic Pathologists' assistant is far superior to an untrained individual. They would also be supported with academic credentials to perform their work. He would be the main contact person in the mortuary with regard to administrative work and act as a link to the Forensic Pathologist. They would also maintain the relevant registers in the mortuary. Currently all this work is done by minor staff without any specific designation.

3.3 Training and cadre position of a Forensic Pathologists' assistant

A suitable training programme could be introduced by the relevant universities for those with Advanced Level qualifications. Suitable candidates could be chosen from among the already existent mortuary laborers. Those who are trained and certified would be appointed as forensic pathologists' assistant depending on the cadre positions. Formal training of mortuary attendants had been introduced in the UK more than seven decades ago.[8] Most of the sophisticated mortuaries in the world today are managed by highly qualified pathologist's assistants and specially trained "mortuary managers".[9]

4 Review meetings of deaths at hospitals

The Forensic Pathologists are in a position to contribute to these review meetings by providing details which are worthy to note. This would be in addition to the Maternal Mortality Review meetings (MMR) and case references related to child abuse. Any post surgical death or medical deaths with unknown disease etiology needs further review. The Forensic Pathologist who had conducted the autopsy could be of immense value in providing detailed information with regard to the cause of death and other important clinico-pathologic findings. Additionally, certain data could be directly obtained from the forensic pathologists (across the country) and centrally processed for more accurate medical statistics.

CONCLUSION

Treading into new horizons beyond autopsies is the order of the day. This could only achieved by better understanding and support among administrators and clinical staff.

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A STUDY ON MODES OF COMMUNICATION IN CASES OF SEXUAL ASSAULT

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INTRODUCTION

The Sexual assaults which have shown an alarming rise are a serious public health problem with hazardous socioeconomic and health related consequences around the globe[1] (eg:- Teenage pregnancy, STI, Abortion, Suicide). This applies to Sri Lanka as well.

Sri Lanka Police Bureau, "Grave Crime Abstract of the 1st quarter of 2012" shows that 458 - rape/incests, 121 - un natural offences/grave sex abuse, 376 - has been reported to them from all over the country[2].

With the growing advances in the technology in the near past, cell phone ownership had become ubiquitous among teens and young adults**.**[3] The Central Bank Annual report of 2012, states that the number of mobile phone connections has increased to 20.3 million in Sri Lanka.[4] As people increasingly use social networking services and mobile phone technologies to communicate and socialise with each other, their use as vehicles for the perpetration of sexual assault is becoming an issue of significant concern for those working in the sexual assault field (Powell, 2009) and is the subject of growing media debate. This concern relates partly to the way in which such technology multiplies avenues for sexual victimisation. It also relates to a lack of understanding among some groups about how these technologies work, what exactly the nature of the problem is and what solutions are required to address perpetration and its impacts[5, 6].

A number of cases have been recently reported in which mobile phone and online communication technologies have been connected to sexual assault victimisation, and there are hardly any research done in Sri Lanka about this issue. Therefore this study is carried out about the modes of communication between the victims and the assailants in our country.

OBJECTIVES

The objective of the study is to determine the modes of communication used between the assailants and the victims in cases of sexual assault.

METHODOLOGY

This study was conducted on the sexually assaulted individuals who were brought to the hospitals in Central, Sabaragamuwa and North Western provinces for medico-legal examination during the period of December 2011 and June 2012.

This is a descriptive cross sectional study and the data was obtained from sexually assaulted females and males using a standard questionnaire by specialists and trainees in Forensic Medicine, maintaining the professional standards. Data was analysed using Microsoft Excel software.

RESULTS

Among 62 sexually assaulted victims, 96% were females. 81% of them were less than 18 years of age and among them, 43% were in 12-16 years age group, 15% were aged below 10 years with 3.2% being below 5yrs. Only 19.3% of the victims were more than 19years old [See Table 1].

Table 01: Age distribution of the victims

Age	0-5	6-9	10-12	13-14	15-16	17-18	>19	Total
%	3.2	12.9	3.2	19.3	32.2	9.6	19.3	100

Table 02: *Monthly income range of the victims*

Income range (Rupees) / Month	**Percentage**
0-5000	16.1
5000-10000	6.4
10000-15000	35.5
15000-20000	16.1
20000-25000	12.9
25000-30000	0.0
30000-35000	6.4
35000-40000	6.4

Regarding the monthly income of the victims/families 74.3% had a monthly income of less than Rs. 20,000, 21.5% less than Rs.10000 with 16% earning less than Rs.5000 and only 12.8% has a monthly income more than Rs.25000 [See Table 2]

1 USD= Rs. 126.7

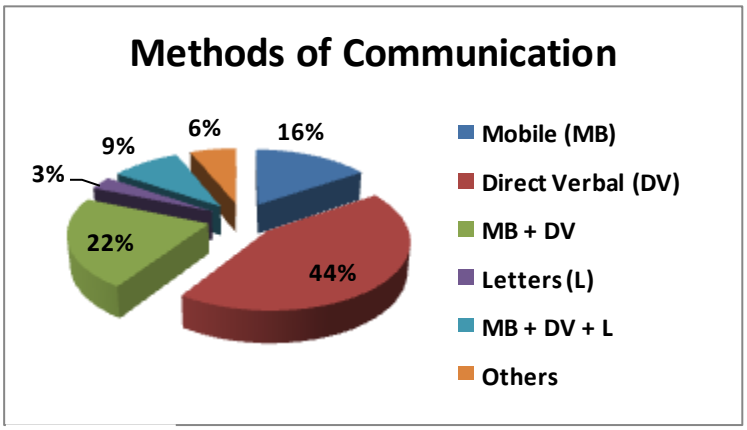


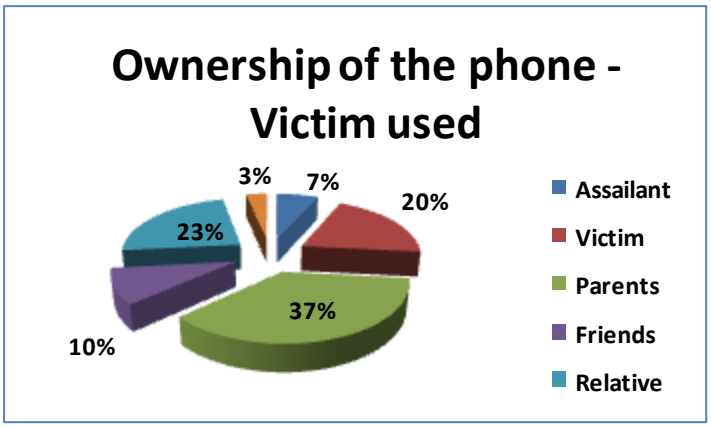
Figure 01

Verbal communication was the commonest method of communication (44%) in which 88% have spoken directly with the assailant, followed by mobile phone and direct verbal (22%) and mobile phone only (16%). 3% had communicated with letters. 9% had communicated with letters, mobile phones, and verbally. However, the mobile phone usage could be seen in 47% of cases [See Fig.01].

Table 04 : *Methods used in mobile phone communication*

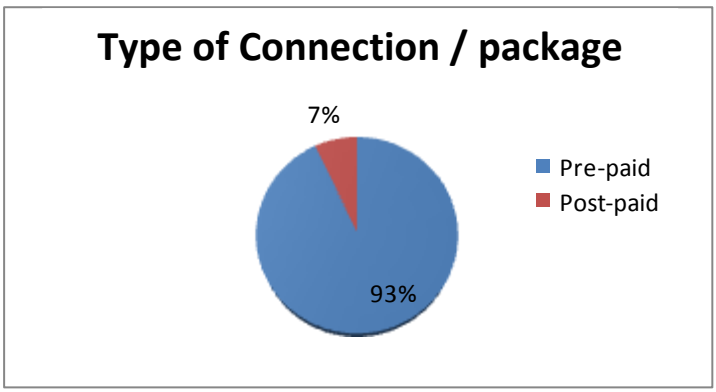
Method of communication	**Percentage**
SMS	-
TALK	27%
MMS	
SMS+TALK	73%

When considering the methods victims used to communicate with the assailant 27% had talked over the phone and 73% have uses SMS (Short Message service) along with speaking over the phone. However there were none who used only SMS as the mode of communication. MMS (Multimedia Message Service) was not found to be used by any of the victims.



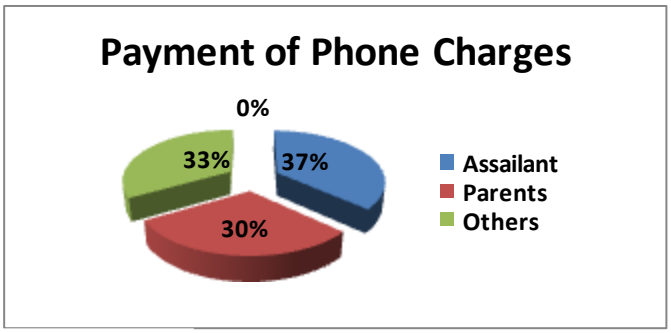
20% of the victims used their own mobile phones, 80% used mobile phones owned by others to communicate with the assailant. 37% had used their parents phones followed by 23% who used their relatives phones, 10% had used their friends phones. Only 7% had used a mobile phone which was owned by the assailant. [See Fig. 02].

Figure 02



93% of the phones used had pre-paid connections, where as 7% had post-paid connections [See Fig. 03].

Figure 03



37% of the time the payments had been settled by the accused and 30% of the time by the parents. [See Fig. 04].

Figure 04

In single episodes of sexual assault, in 80% of cases direct verbal communication was seen with 10% showing the use of a mobile phone also. In single episodes there were no victims who used a mobile phone only for communication. In multiple episodes 63% of victims had used a mobile phone with only 29% having had direct verbal communication only [See Table 03].

Table 03: *Frequency of sexual assault vs. Methods of Communication*

Number of sexual assault	***Number of victims***	**Methods of communication**			
		Direct verbal	***Mobile***	***Mobile + direct verbal***	***Others***
Single	20	70%	0%	10%	20%
Multiple	42	29%	37%	26%	08%

DISCUSSION

The prevalence of unwanted sexual interaction, sexual violence and sexual abuse among young people is increasing rapidly throughout the world and specially so in developing countries like ours. Young people, particularly young women, comprise an "at-risk" demographic in relation to sexual violence.[7] Studies have revealed that for both males and females, in a majority of cases the perpetrator and the victim knew each other.[8]

It is known that the ever-increasing use of communication technologies such as the Internet (particularly online social networking sites) and mobile phones in the commission or promotion of sexual assault has emerged as a challenging issue for support services, criminal justice agencies, and - with the ubiquity of technology in young people's lives - schools, educators and parents.[9]

It has been reported in many studies that most of the sexually assaulted victims were females and our study sample also consisted of 96% of females.[10, 11, 12, 13] A majority of them were less than 18 years. It has been reported in the literature that the victims were usually in their teens.[8, 10, 12, 14, 15, 16] In our study group 71.63% of the victims were from low socioeconomic group. Ganguly et al[17] reported 60% of the victims were from poor families and 43% were illiterate. Similar findings were observed by Sarkar et al.[8]

When considering the communication methods, verbal communication was the commonest method used which included direct verbal and also verbal communication via a mobile phone. Short messages and letters were also used by a minority. Altogether mobile phone usage could be seen in 47% of cases. The methods victims used to communicate with the assailant using the mobile phones showed that, 27% had talked over the phone and 73% have used SMS along with speaking over the phone. However there were none who used only SMS as the mode of communication. 20% of the victims used their own mobile phones, 80% used mobile phones owned by others to communicate with the assailant. 37% of the time the payments had been settled by the accused and 30% of the time by the parents. 93% of the connections of the mobile phones had pre-paid packages and only 7 % had post-paid ones. As post- paid packages usually provide the customers with a detailed bill it is likely that the assailants preferred to use the pre- paid connections which would not leave evidence of the details of use of the phone, for the parents of the victims or any other party to see. In single episodes of sexual assaults, in the majority of cases direct verbal communication was seen with only a minority showing mobile phone usage which was vice versa when it came to multiple episodes of sexual assaults.

In this study we did not come across any who had used social networking sites as a mode of communication. But with the developing technology, smart phones, tabs etc which have easy access to the internet are being commonly and increasingly used by the youth in our country.[18] This has led to social networking sites become part of the everyday activities of the young. Therefore we should be vigilant to

the dangers of those and an increase in the number of sexual assaults can be expected.

Educating parents as well as young adults about the possibility of sexual assaults and other serious consequences of using mobile phones and when using social networking sites to contact strangers and coming up with certain age restrictions for the use of those would help in reducing the number of sexual assaults among young individuals. At the same time health education targeted on vulnerable groups regarding sexual behaviour, legal aspects of sexual and partner relationship in an organized system is important for primary prevention of sexual assaults.

SUGGESTIONS

It appears that the unhindered access to mobile phones by the young individuals and technological advancements in the mobile telephony had facilitated the commission of sexual offences. The parents and guardians should be extra vigilant about the unfettered usage of mobile phones by the youth.

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FATAL DELIBERATE SELF HARM IN MANIPAL, INDIA: AUTOPSY STUDY

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ABSTRACT

Fatal deliberate self harm (FDSH) or Suicide is a devastating act causing a great deal of suffering to survivors, relatives, friends and other people near to the victim of suicide. It is also a public health problem causing loss of life years, particularly in young people. In most countries suicide is condemned for cultural or religious reasons and surrounded by taboo (WHO 2002).

The present study sample consisted of 656 cases of fatal deliberate self harm (FDSH) out of the 3571 total autopsy cases. The occurrence of FDSH was 18.37% of all the medico-legal autopsies conducted (3571 cases) during the study period (1992-2012). The present study shows that the people of all age groups were involved. The highest incidence was amongst the 21–30 years (35.06 %) followed by 31–40 years (19.35 %). Male victims predominated .Of these 656 cases, 436 (66.5%) were males and 220 (33.5%) were females. Present study predicts marriage as being one of the important risk factors for suicide. 417 cases out of 656 cases (57.3 %) were married. Most of the victims belonged to the Hindu religion (86.4 %) followed by Christians (8.4 %) and Muslims (3.7 %). When we look at the presence of any past illness, 174 cases (26.5%) were having some form of chronic physical and mental disorders at the time of committing suicides. Although seasonal variation is not much, however the present study reveals highest number of cases in summer season (36.1%), followed by the winter, the rainy season. Despair with life due to financial restraints and family and marital disharmony constituting 79 % of the total cases was the most common motive for FDSH. 74.4 % of the total victims in the present study used chemicals for terminating their lives and only 26.8 % of the study group used physical methods for committing FDSH. Amongst those who opted for physical methods, hanging was the most common (15.6 %) followed by burns (7.1 %). Among the poisoning cases, organ phosphorus poisoning (51 %) was the most commonly used method for suicide

INTRODUCTION

Suicide (self inflicted death) is a complex phenomenon associated with psychological, biological and social factors involving by and large every corner of the world. It is distinctively a human affair and continues to be a major public health issue. It has always attracted the attention of not only the medical fraternity but also of the philosophers and theologians.[1, 2]

According to Durham, the French biologist, suicide is "death resulting directly or indirectly from a positive or negative act of the victim himself, which he knows will produce this result". Suicide from an existential point of view reflects a behavior that seeks and finds the solution to an existential problem by making an attempt on life of the subject. Suicide is applicable to all acts terminating fatally.[1, 2, 3.]

A 2006 report by the World Health Organization (WHO) states that nearly a million people take their own lives every year, more than those murdered or killed in war. Suicide rates are highest in Europe's Baltic states, where around 40 people per 100,000 die by suicide each year, second in line is in the Sub-Saharan Africa where 32 people per 100,000 die by suicide each

year. The lowest rates are found mainly in Latin America and a few countries. In most countries the incidence of suicides is higher than that in Asia, So also in India the National crime research Bureau (NCRB), 2010, in their annual report on Incidence and Rate of Suicides during the Decade (2000-2010) have reported that, more than one lakh persons (1,34,599) in the country lost their lives by committing suicide during the year 2010. This indicates an increase of 5.9% over the previous year's figure (1, 27,151).

The number of suicides in the country during the decade (2000–2010) has recorded an increase of 23.9% (from 1, 08,593 in 2000 to 1, 34,599 in 2009). The increase in incidence of suicides was reported each year during the decade except in 2001. The population has increased by 18.3% during the decade but the rate of suicides in 2010 was 11.4 which are greater than 10.8 recorded in 2000. The rate of suicides has shown a declining trend since 2000 to 2003. An increasing trend is observed during 2006 to 2010. There were 369 suicide cases every day and 15 Suicides took place every hour, in spite of the fact that suicide is still considered a crime under section 309 Indian Penal Code.[6]

Considering these facts, and keeping in view the magnitude of this problem, an attempt has been made in the present study to make a complete and thorough analysis of deliberate self harm in terms of various epidemiological features, recent trends and to identify the risk factors associated with it

MATERIALS AND METHOD

Present study is both prospective (October 2010 – May 2012) and retrospective (January 1992 – October 2010) over a span of 20 years (January 1992- May 2012). The department of Forensic Medicine in Kasturba Medical College, Manipal undertakes medico-legal autopsies of un-natural deaths occurring in its Jurisdiction of Manipal Police Station and also takes cases referred from the adjoining districts and states of southern India. In case of retrospective study relevant data regarding the suicide was gathered from the autopsy files maintained in the department of Forensic Medicine, Police inquest reports and Hospital case records (if available). In case of prospective study, along with the above mentioned data, information was obtained from close relatives of the victims present at the mortuary as regarding the motive of the act and other relevant questions.

The manner of death was constructed as suicide or otherwise based on the inquest reports of the investigating officer

RESULTS AND OBSERVATIONS

A Total 3571 cases were autopsied in the department of Forensic Medicine, Kasturba Medical College, Manipal, Karnataka during the period of 20years from January 1992 to May 2012, out of which 656 were cases of Fatal Deliberate Self Harm (FDSH) or Suicide constituting 18.37 % of total cases as depicted in Table No. 01.

Table 01: *Total number of autopsies*

Year	Total number of autopsies	Suicide cases	Percentage (%) of suicide cases
1992	35	5	14.2
1993	157	18	11.46
1994	174	30	17.24
1995	154	34	22.0
1996	181	38	20.99
1997	174	39	22.41
1998	154	36	23.37
1999	161	43	**26.70**
2000	163	35	21.47
2001	199	43	21.60
2002	158	34	21.51
2003	113	19	16.81
2004	129	20	15.50
2005	141	21	14.89
2006	154	16	10.38
2007	151	25	16.55
2008	196	30	15.30
2009	233	32	13.73
2010	301	54	17.94
2011	308	57	18.50
2012(up to May)	135	25	18.51
Total	**3571**	**656**	18.37

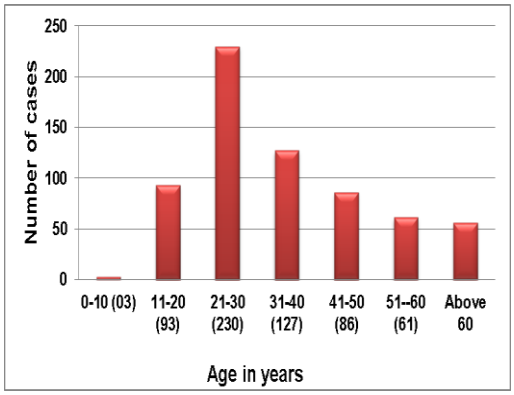
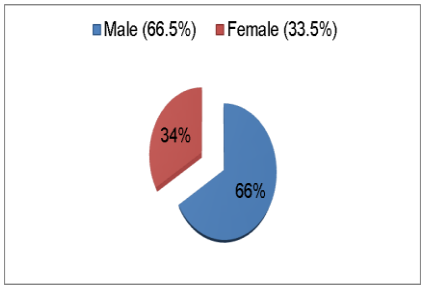


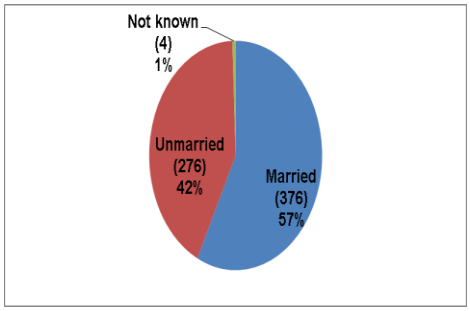
Figure 01: *Age of victims*

In our study, we observed that the highest incidence of suicide cases were found in the age group of 21-30 years which accounted for 35.06 % of total cases, followed by the age group of 31 to 40 years. The least affected group was 0-10 years who accounted for 0.45 % of total cases, as depicted in the **Fig. No. 01**



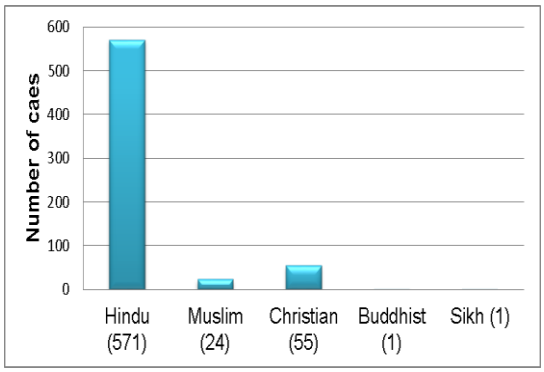
In our study, we observed that men outnumbered women, as depicted in the **Fig. No. 02.**

Figure 02: *Gender distribution of the victims (n = 656)*



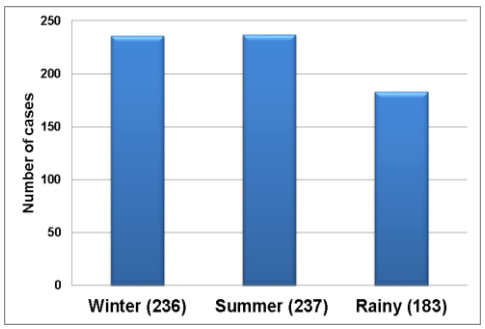
Our study showed that most of the decedents were married which accounted for (57.3 %) of all the cases of Fatal Deliberate Self Harm (FDSH), as depicted in **Fig. No. 03.**

Figure 03: *Marital Status of the victims*



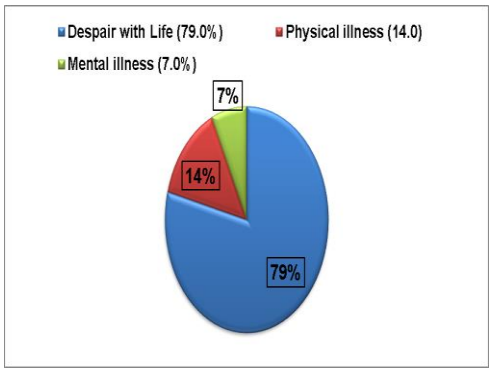
Most of the victims in this study were followers of the Hindu religion who accounted for 86.9% of all the cases of Fatal Deliberate Self Harm (FDSH), followed by the Christians 8.4 %, Muslims 3.7 % and others 0.30 % respectively, as depicted in the **Fig. No. 04.**

Figure 04: *Religion of the victims.*



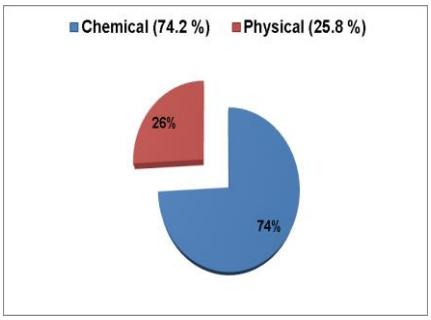
36.1 % of the victims committed Suicide during the Summer months, closely followed by the winter season which accounted for 36.0 % of all the cases, rainy season witnessed the least number of fatalities 27.9 %. **Fig. No. 05.**

Figure 05: *Seasonal variation in FDSH*



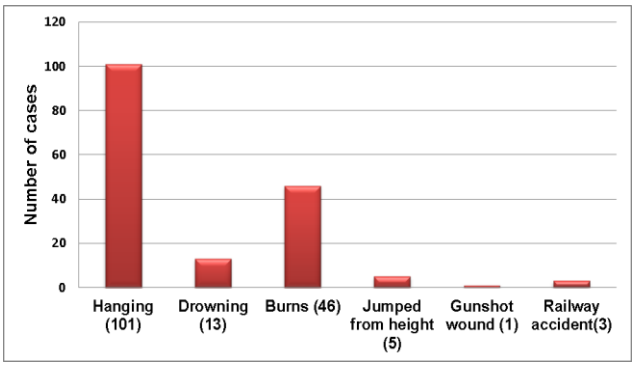
Present study observed that despair with life was the main motive for FDSH in 79 % of victims. Physical illness and Mental illness accounted for 14 % and 7 % of the total cases respectively in **Fig. No. 06**

Figure 06: *Motive for FDSH.*



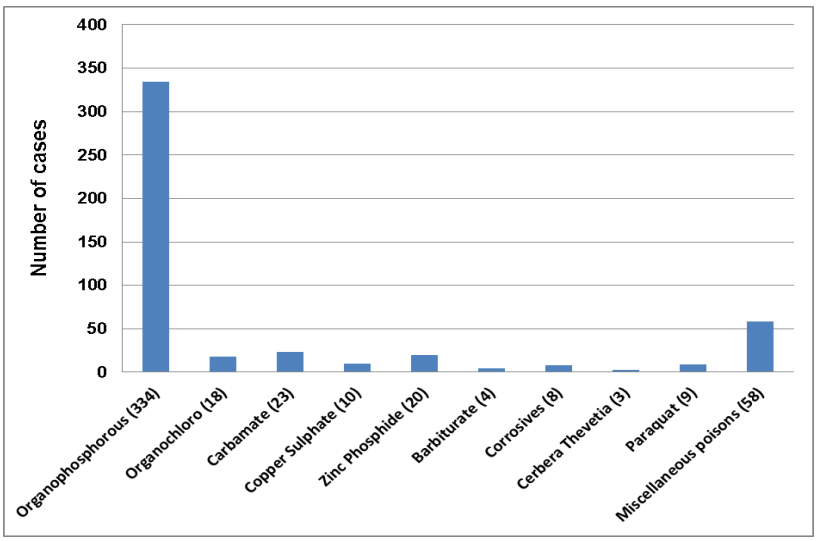
The majority of the decedents used chemical means to kill themselves and accounted for 74.2 % of the total cases, Physical method was used by the remaining victims of FDSH as Depicted in **Fig. No. 07.**

Figure 07: *Methods used for FDSH*



One fourth of the total population studied (25.8 %) opted for FDSH by physical means. Hanging contributing for the maximum number of cases 15.6 %, followed by burns 7.1 %, drowning 2.1 %, fall from height 0.8 %, railway accident 0.5 % and gunshot wound 0.2 % respectively, as depicted in the **Fig. No. 08.**

Figure 08: *Physical methods*



Analysis of the type of poison consumed for FDSH showed that 74 % of the decedents consumed some chemical substance, the most common compound being Organ phosphorous insecticide (50.9%), other poisons and their percentage as depicted in **Fig. No.09**

Figure 09: *Chemical methods adopted*

Present study showed that 20.7 % of the decedents suffered from some kind of chronic physical illness disorders like Chronic Heart Disease (CHD), Diabetes, Renal failure, Bronchial asthma, Tuberculosis and Malignancy that included Carcinoma Breast, endometrial, stomach, lung and appendix. Mental illness included disorders ranging from Mental retardation, schizophrenia, bipolar disorders and depression which accounted for 3.6 % of all the cases and a combination of both was observed in 2.2 % of all the cases under study. There was no history of any illness in 73.5% of all the cases studied during the study period as depicted in **Table No. 02.**

Table 02: *History of illness (n = 656)*

History of illness	Number of cases	Percentage (%)
Mental illness	23	3.6
Chronic Physical Illness including Malignancy	137	20.7
Combination of both	14	2.2
No history of illness	**482**	**73.5**
Total	**656**	**100.0**

DISCUSSION

Fatal deliberate self harm (FDSH) or Suicide in general, across various civilizations, has been considered as a shameful act. Although it is widely encountered, the aetiology and various complexities involved are unfortunately ill-understood. A proper understanding of these aspects is a pre-requisite for suicide investigation.[1]

Suicide receives increasing attention worldwide, with many countries developing national strategies for prevention. Rates of suicide vary greatly between countries, with the greatest burdens in developing countries**.**

Trends of suicide vary widely according to time, region, age group, sex, and race. Despite mixed trends of increases or decreases in suicide rates around the world, suicide remains an important public-health problem. In an effort to understand and prevent suicide, researchers have investigated medical, psychosocial, cultural, and socio-economic risk factors associated with the environment as a promising line of research.

The present study sample consisted of 656 cases of fatal deliberate self harm (FDSH) out of the 3571 total autopsy cases. The occurrence of FDSH was 18.37% of all the medico-legal autopsies conducted (3571 cases) during the study period (1992-2012). It was 21.2% in another reported work done by Arun[1]

The present study shows that the people of all age groups were involved. The highest incidence was amongst the 21–30 years (35.06 %) followed by 31–40 years (19.35 %). This observation was identical with the available literatures and studies done by Arun,[1, 2, 3] B. D Gupta,[5] National crime record bureau,[6] Sachidananda.M,[7] Behera,[8] Lisa,[18] B.R. Sharma,[24] Lalwani,[54] Fernando,[59] Gajalaxmi[110]. This is expected, as this age group comprises the majority of the population. Data from the World Health Organisation reports[21] that adolescents and elderly individuals are at a higher risk of committing suicide. Young individuals are prone to being unable to cope with the turbulence occurring in their lives and so opt for deliberate self harm more often.[1, 5, 6, 7, 8, 18, 24, 54, 59, 110.] But in contrast a study in Japan,[7] Mexico[1] and in South Carolina, USA,[38] revealed that the most common age group of the victims was over 65 years.

Male victims predominated and this finding is consistent with the findings as observed by Arun,[1, 2, 3] B. D Gupta, [5] National crime record bureau,[6] Sachidananda.M,[7] Behera,[8] Danielle,[11] Lisa B.R,[18] S. Lalwani,[54] Ravindra Fernando, [59] and Vendhan[110]. Studies in other parts of the world also showed male predominance in suicides like in Cork City, in South Carolina, USA[1, 7, 38] and in Geneva[1, 7]. A study in England and Wales by Kelly and Bunting J[65] suggests that there is an increase in the rate of suicide in both sexes but greater in males. The reasons being that the population of males are higher than that of female's worldwide.[1-3, 5, 6, 7, 11, 18, 54, 59,110] However a literature search shows that, while men are known usually to commit suicide successfully, women have outnumbered men in non-fatal unsuccessful suicidal attempts.[1, 5,14,13,17.] But in contrast to our observations in China, and in some studies done in India females commit more suicides than males.[24, 38, 60, 64, 63, 75.]

Present study predicts marriage as being one of the important risk factors for suicide. 417 cases out of 656 cases (57.3 %) were married which is almost similar to the findings observed in other parts of India (65 %).[1,5,7] Married people (57.3 %) outnumbered their unmarried counterparts in Fatal deliberate self harm which is consistent with the study done by Arun,[1, 2, 3] Sachidananda.M [7]. The reason for more suicides in married ones may be linked to the two most common causes of suicides (marital disharmony and financial burden).[1] But in Thailand similar incidences of suicides among both married and unmarried have been observed.[7] However, western studies highlight that a high incidence of suicide has been observed among unmarried people.[1] The present study shows that there are probably different factors relating to marital or family life that are operating in the Indian culture. The institutions of 'marriage' and 'family' are given the utmost respect and are followed with great fervour in the Indian tradition, whereas 'live-in' relationships without marriage are more popular in the western world.[1]

Most of the victims belonged to the Hindu religion (86.4 %) followed by Christians (8.4 %) and Muslims (3.7 %) consistent with the studies done by Arun.[1, 2] and Sachidananda.M. [7] In India, a major part of the population follow Hinduism as their religion.[1] Besides some isolated cases of Christians and Muslims, almost all the victims belonged to the Hindu religion. ''Upanishads'', the Holy scriptures of Hindus had condemned suicide and stated that 'he who takes his own life will enter the sunless areas covered by impenetrable darkness after death'. But the ''Vedas'' permitted suicide for religious reasons. It viewed that the best sacrifice, that could be made was one's own life.[7]

When we look at the presence of any past illness, 174 cases (26.5%) were having some form of chronic physical and mental disorders at the time of committing suicides most commonly encountered diseases being hypertension, diabetes, malignancies of the lung, breast, stomach and mental illness including schizophrenia, bipolar disorders and depression which was similar to the studies done by A Behera, [8] Danielle,[11] Cavanagh J, [49] Suleyman Goren.[75] But in contrast to our findings some studies have stated that the main risk factor for both attempted and completed suicide is psychiatric disorder. [22, 16, 46, 48, 49, 50, 75]

Although seasonal variation is not much, however the present study reveals highest number of cases in summer season (36.1%), followed by the winter, the rainy season witnessed the least number of fatalities which is consistent with the studies done by B. D Gupta, [5] Sachidananda.M, [7] Lisa.[18] But contrast to the above finding was observed in Faisalabad, where a seasonal surge was observed in spring.[7] In other studies conducted in India[1] FDSH was seen more during the winter months and in other parts of the world,[18, 37,38] a spring peak for male and spring and autumn peaks for female suicides were found.

Despair with life due to financial restraints and family and marital disharmony constituting 79 % of the total cases was the most common motive for FDSH. Our findings are different from other reported works, which show a high correlation between mental illness and FDSH,[22, 16, 46, 48, 49, 50, 75] but was similar to the studies done by Arun[1, 2], Lisa[18], B.R. Sharma [24]. In contrast to the statistics that mental illness is a predominant cause (90 % as per WHO statistics, 51 % as in Singapore and 64.5 % as in Wolver Hampton), we observed only 7.1 % of all suicidal cases had mental illness. The reason may be reluctance by the people of this locality to attend a clinic for simple psychiatric complains consistent with finding of Sachidananda.M.[7] Quite contrast to our findings, studies in South Carolina,[7, 38] USA,[38] and in Japan suggest dreadful diseases followed by problems of economic distress to be the two most common causes of suicide. Dreadful diseases contributed much less towards the causes of suicide in the present study.

74.4 % of the total victims in the present study used chemicals for terminating their lives and only 26.8 % of the study group used physical methods for committing FDSH, which is in accordance with the various study done in India and worldwide by Arun[1, 2, 3], B.D Gupta [5], Sachidananda.M [7], and B.R. Sharma [24]. But in contrast to our study some studies done in India and abroad have shown that the physical methods are most commonly employed method for Fatal deliberate self harm (FDSH).[9, 11, 18, 52, 53, 75.]

Amongst those who opted for physical methods, hanging was the most common (15.6 %) followed by burns (7.1 %). This is in accordance with the findings observed by Arun,[1] Sachidananda.M,[7] Danielle.[11] However, in another study, in Kildare, Ireland,[1] hanging was the commonest method employed and in South Carolina,[102] suicide by gunshot was commonly noted in children under the age of 18 years. Hanging is universally available and it is the most common method of suicide globally.[1, 2, 3, 5, 6, 7, 8, 9, 11, 20, 52, 53, 102.] In many places, the ready access to firearms makes them potentially dangerous, especially among male adolescents and young adults.[18, 75] Death by firearm was the leading method of suicide in a study done in USA,[18, 38] accounting for 67.5 % of all deaths. Regional and state-level analysis (1988–1997) of the United States demonstrated a "robust association" between the rates of household firearm ownership and suicide.[41] Domestic gas has been reported in some studies as a frequently used suicide method.[1, 5, 52, 53, 102.]

Among the poisoning cases, organophosphorus poisoning (51 %) was the most commonly used method for suicide, which is in contrast to the findings observed in England and Wales,[65] wherein vehicle exhaust gas has been commonly used and carbon monoxide poisoning was common in Japan.[7, 9] Finding similar to our study have also been observed in India and in other countries by Arun[1, 2, 3,] Sachidananda.M [7] and Keith Hawton.[38] Miscellaneous poisons included Paraquat, Kerosene, Phosphorus, Chlorpromazine, Glyphosate and Cyanide constituting (4%) of the total cases. People in this region have easy accessibility to organophosphorous insecticides since these are commonly used for agriculture. So whenever there is a tendency to commit suicide, these means are readily available.[1, 2, 3, 5, 7,8,20,102.]

CONCLUSION

- The incidence of Fatal Deliberate Self Harm (FDSH) was more in the age group of 21-30 years (35.06 %) and lowest in the age group of less than 10 yrs (0.45 %).
- Males outnumbered females in our study (66.5 %). The male female ratio was 2:1.
- Majority of the suicide victims were married (57.3 %).
- Majority of the victims of Fatal Deliberate Self Harm (FDSH) belonged to the Hindu religion (86.95 %).
- 75 % of the decedents of Fatal Deliberate Self Harm (FDSH) didn't have any history of illness.
- 25% of the victims of Fatal Deliberate Self Harm (FDSH) had a history of Physical illness and mental illness ranging from hypertension, diabetes, carcinoma to schizophrenia and depression.
- The most favored season for Fatal Deliberate Self Harm (FDSH) was summer, constituting 36.1% of the total cases analysed.
- Despair with life along with financial constraints (79.0 %) was the most common motive for the victims of Fatal Deliberate Self Harm (FDSH).
- The most common method used for Fatal Deliberate Self Harm (FDSH) was chemical method constituting 74.2 % of the total cases.
- The most common physical method adopted was hanging constituting 15.6% of the total number of cases.
- The most common poison consumed was Organ phosphorus insecticide (51%).

The finding of our study is in accordance with various workers not only in India but studies done worldwide.[1, 2, 3, 5, 7, 8, 9, 10, 11]

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