**Profile of Medico-legal Cases Coming to Emergency ward of B. P. Koirala Institute of Health Sciences**

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**Abstract**

**Background:** Medico-legal case usually presents as an emergency case in any hospital. Profiling of these cases provides with evidence on the burden of the medico-legal cases and identifying ways to better manage these cases in the emergency ward of hospitals.

**Objective:** To study the profile of medico-legal cases coming to the emergency ward of B. P. Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal.

**Material & Methods:** We conducted a retrospective review of all medico-legal cases presenting in the emergency ward of BPKIHS from April 2015 to March 2016. The cases were profiled for socio-demography, injury and diagnosis from the medico-legal register at the emergency ward of BPKIHS.

**Results:** Medico-legal cases comprise almost 10% of all cases at the emergency ward of BPKIHS. A total of 3,715 cases were included in this study. Half (50.0%) of the cases fell in to the category of 25-59 years. Males were almost twice (62.7%) in number, compared to females (37.3%). The top three diagnoses among medico-legal cases are road traffic accidents (41.81%), physical assault (21.13%) and poisoning (20.08%). Other diagnoses were burns, fall injury, sexual assault, self inflicted injury, hanging, gunshot injury, stab injury, machinery injury, drug overdose, blast injury, brought dead, trauma by animal, electrical injury, snake bite and human bite.

**Conclusions:** There are significant numbers and wide varieties of medico-legal cases that present in the emergency ward of BPKIHS. Given the large number of cases presenting at BPKIHS, there is a potential for future research on medico-legal cases for academic and policy purpose.

**Keywords:** Medico-legal profile, Road traffic accidents, Injuries in Nepal.

**Introduction**

A case of injury or illness for which the attending doctor is required to provide an opinion for investigation by a law enforcement agency after assessment of the patient in accordance with the law of the land is commonly known as a medico-legal case.¹

Apart from medical emergencies, emergency ward also deals with the medico-legal cases more frequently than any other department of a general hospital. The medico-legal cases contribute to the workload of the clinician at the emergency ward. Emergency ward is a common entry point for such cases, as most cases require urgent medical attention as well.² It is essential to know the pattern and magnitude of medico-legal cases with respect to the types of cases, age and sex of cases, time of arrival in the
emergency ward, months and seasons of arrival of cases in casualty; and analyze the data and find out suggestion for improvement of medico-legal work in emergency ward.\textsuperscript{1,3} Profiling of Medico-legal case is an integral aspect for the Emergency ward for prevention of preventable causalities in future and to study the crime rate in the area.\textsuperscript{4} Several studies emphasise that profilling of medico-legal cases presenting at the emergency ward are essential to provide better care at the ward by knowing what kind of case load to expect and to prepare accordingly.\textsuperscript{1,4,5} Medico-legal service in Nepal is still at its primitive phase. Limited number of forensic medicine expertise in the country puts the burden into all medical doctors who may or may not be trained adequately in managing a medico-legal case.\textsuperscript{6}

B. P. Koirala Institute of Health Sciences, teaching hospital has been providing services for the medico-legal cases in Eastern Nepal since 1994.\textsuperscript{7} We can find profiles of different diseases diagnosed\textsuperscript{8} and different services being provided at BPKIHS\textsuperscript{9} in the literature. However, we could not find a profile of medico-legal cases at the Emergency Ward of BPKIHS in published peer reviewed literature so far. We, therefore, found it necessary to gather information on medico-legal cases towards providing scientific evidences for future programs and contribute for public health interventions in related fields.

**Objective**

This study is conducted to study the profile of medico-legal cases coming to the emergency ward of BPKIHS.

**Material & Methods**

A retrospective review of medical records was done to include all medico-legal cases presenting in the emergency ward of BPKIHS in one year (April 2015 - March 2016). We excluded any cases with incomplete records found at medico-legal register. The review included 3,715 cases. Socio-demographic profile, injury profile and diagnoses were recorded from the medico-legal register. All personal identification of the cases was removed from the analysis. Data were presented using frequency and percentages.

The study was conducted after taking ethical clearance from the Institutional Review Committee of BPKIHS.

**Results**

A total of 3,715 cases was included in this study. Half (50.0%) of the cases fell into the category of 25-59 years. Males were almost twice (62.7%) in number, compared to females (37.3%). Most cases came from Saptari (45.2%), followed by Sunsari (29.1%). The socio-demographic characteristics of medico-legal cases can be seen in table 1.
Table 1: Socio-demographic profile of the medico-legal cases (n= 3,715)

| Characteristics | Frequency | Percentage |
|-----------------|-----------|------------|
| Age (years)     |           |            |
| 0-14            | 134       | 3.6        |
| 15-24           | 1377      | 37.1       |
| 25-59           | 1859      | 50.0       |
| 60 and above    | 345       | 9.3        |
| Sex             |           |            |
| Male            | 2330      | 62.7       |
| Female          | 1385      | 37.3       |
| Ethnic Group    |           |            |
| Janajati (Hill & Terai) | 1459 | 39.3 |
| Brahmin/Chhetri (Hill) | 832 | 22.4 |
| Madhesi         | 992       | 26.7       |
| District        |           |            |
| Saptari         | 1680      | 45.2       |
| Sunsari         | 1081      | 29.1       |
| Morang          | 285       | 7.7        |
| Dhankuta        | 133       | 3.6        |
| Jhapa           | 122       | 3.3        |
| Siraha          | 97        | 2.6        |
| Udayapur        | 58        | 1.6        |
| Others          | 259       | 6.9        |

Road traffic accidents (41.8%) comprised of the most number of medico-legal cases at B. P. Koirala Institute of Health Sciences, followed by physical assault (21.1%) and poisoning (20.1%). The detailed list of diagnosis of the medico-legal can be found in table 2.

Table 2: Categories of the medico-legal cases (n= 3,715)

| Type       | Diagnosis          | Frequency | Percentage |
|------------|--------------------|-----------|------------|
| Accidental | Road Traffic Accident | 1554      | 41.8       |
|            | Burns              | 139       | 3.7        |
|            | Fall Injury        | 125       | 3.4        |
|            | Machinery Injury   | 22        | 0.6        |
|            | Trauma by animal   | 8         | 0.2        |
|            | Electrical Injury  | 7         | 0.2        |
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Among the top three diagnoses, age group 25-59 years comprised of the highest proportion in road traffic accident (52.5%), physical assault (51.5%) and poisoning (45.8). The proportion of males was higher for road traffic accident (71.2%) and physical assault (67.5%). However, the proportion of females (52.3%) was higher for poisoning. The detail diagnosis according to age and sex is listed in table 3.

Table 3: Diagnosis of medico-legal case according to age and sex

| Diagnosis                  | 0-14 n (%) | 15-24 n (%) | 25-59 n (%) | ≥ 60 n (%) | Male n (%) | Female n (%) | Total n (%) |
|----------------------------|------------|-------------|-------------|------------|------------|-------------|-------------|
| Road Traffic Accident      | 67 (4.3)   | 518 (33.3)  | 816 (52.5)  | 153 (9.8)  | 1107 (71.2)| 447 (28.8)  | 1554 (100)  |
| Physical Assault           | 11 (1.4)   | 300 (38.2)  | 384 (51.5)  | 70 (8.9)   | 530 (67.5)| 255 (32.5)  | 785 (100)   |
| Poisoning                  | 14 (1.9)   | 329 (44.1)  | 342 (45.8)  | 61 (8.2)   | 356 (47.7)| 390 (52.3)  | 746 (100)   |
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| Diagnosis          | 0-14 n (%) | 15-24 n (%) | 25-59 n (%) | ≥ 60 n (%) | Sex | Total n (%) |
|--------------------|------------|-------------|-------------|------------|-----|-------------|
| Burns              | 8 (5.8)    | 45 (32.4)   | 72 (51.8)   | 14 (10.1)  | 57 (41.0) | 82 (59.0)   | 139 (100) |
| Fall Injury        | 3 (2.4)    | 41 (32.8)   | 62 (49.6)   | 19 (15.2)  | 92 (73.6) | 33 (26.4)   | 125 (100) |
| Sexual Assault     | 17 (21.0)  | 32 (39.5)   | 27 (33.3)   | 5 (6.2)    | 0 (0.0)   | 81 (100)    | 81 (100)  |
| Cut injury         | 2 (2.6)    | 32 (41.0)   | 41 (52.6)   | 3 (3.8)    | 52 (66.7) | 26 (33.3)   | 78 (100)  |
| Hanging            | 2 (4.2)    | 16 (33.3)   | 25 (52.1)   | 5 (10.4)   | 25 (52.1) | 23 (47.9)   | 48 (100)  |
| Gun shot           | 2 (5.3)    | 13 (34.2)   | 18 (47.4)   | 5 (13.2)   | 34 (89.5) | 4 (10.5)    | 38 (100)  |
| Others*            | 8 (6.6)    | 51 (42.1)   | 52 (43.0)   | 10 (8.3)   | 77 (63.6) | 44 (36.4)   | 121 (100) |

*Stab Injury (24), Machinery Injury (22), Drug overdose (20), Blast Injury (17), Brought dead (14), Trauma by animal (8), Electrical Injury (7), Snake bite (7) & Human bite (2)

Discussion
Medico-legal cases comprise about 10.5% (3,717 cases) of all emergency ward visits (35,324 cases) at the B. P. Koirala Institute of Health Sciences, Dharan, Nepal. A productive age group of (25-59) years comprised of half of the medico-legal cases in this study. This is in line with other studies as well. The productive age group is also prone to being involved in medico-legal issues. The proportion of males is higher among the cases, which is also in line with other studies.

While the institute is located in Sunsari district, a high proportion of medico-legal cases visiting the emergency ward in this institute is from Saptari district. There are other government hospitals also present in east Nepal which are mandated by the Government of Nepal to conduct medico-legal investigation. This could be an issue for further discussion, whether medico-legal cases are actually higher in Saptari or there are other reasons why this number is high in this institute.

Road traffic accidents are among the highest contributors to the number of medico-legal cases in this study. This is in line with two studies from Nepal and studies from India. However, in some centers, road traffic accidents are not among the top diagnosis among the medico-legal cases. The reason for these differences could be due to differences in the location of the hospital in urban or rural area and the catchment area of the hospital.

Physical assault is higher among males. Males are physically more active and are involved in outdoor activities. This may also expose them to more interactions and possibly more physical assault. This could further be explored.
Poisoning (52.3%) is higher in females. A study from west Nepal also reports higher incidence of poisoning among females among the medico-legal cases. Agriculture is the major occupation in Nepal and pesticide use is common among these households in Nepal. Poisons are more accessible to women, as rat poisons and pesticides are in small stock at home for agriculture and household use. Burns (59.0%) is another diagnosis that is higher among females. This could be due to household accidents in the kitchen among women. The use of sari among women is considered a risk for catching fire in the kitchen.

Sexual assault is exclusively reported only among females. About 2% of the cases reporting as sexual assault can be considered a significant number socially, as there are 81 reported cases in a year. As sexual assault also is linked to the male dominance of the society and carries a stigma along with it is very commonly under reported. Thus, we can expect that there could have been higher number of sexual assaults than is reported at the hospital.

While keeping fire arms is illegal by civilians in Nepal, gunshot injuries are reported during political movements. The 38 gunshot injury cases in this study came during the politically motivated civil unrest, followed by earthquake in 2015. There were gunshot injury cases reported in other hospitals as well during that time. While it may not seem like common cases for medico-legal issues, fall injuries, burns, injury by animals, trauma by machines, electrical injury, snake bite and human bite fall under medico-legal category in Nepal. Some of these are seen in India as well. These cases bring accusations of intentional harm by another person for personal and social reasons.

With these varieties of cases and a significant proportion of cases visiting the emergency ward of B. P. Koirala Institute of Health Sciences, the attending doctors need to be updated with medico-legal importance and correct way of management of such cases. The medical officers need to be trained and oriented to the management of such cases.

Conclusion
There are a variety of medico-legal cases presenting at the B. P. Koirala Institute of Health Sciences. There may be a need for further research to identify ways to identify burden of these medico-legal cases add to the case load at the emergency ward. Emergency department of BPKIHS may be a good place for future studies involving medico-legal cases.

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