Need of Improvement in Emergency Medical Service in Urban Cities

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ABSTRACT

Introduction: An effective Emergency Medical Service system does not exist in Nepal. For an effective EMS system to be developed the scale of the problem and the existing facilities need to be studied.

Methods: Prospective observational study was carried out on 1964 patients attending Emergency Department at Patan Hospital during one month period of September 2006. The patients were specifically enquired on mode of transport used, place of origin and whether they called for an ambulance or not. Patients triage category at the time of triaging was also noted. Information on ambulance service were collected by direct interview with the service providers and the total number of patients attending Emergency Departments daily were collected from the major hospitals of the urban Lalitpur and Kathmandu. MS Excel and SPSS software were used for data entry, editing and analysis.

Results: Total 9.9% patients arrived in ambulance whereas 53.6% came in a Taxi, 11.4% came in private vehicle, 13.5 % came by bus, 5.4% came by bike and the rest 6.2% came by other modes of transportation. Only 13.5% of triage category I patients took the ambulance. There were 31 service providers with 49 ambulances and 720 patients per day attend Emergency Departments in the surveyed area.

Conclusions: Very less number of patients use the ambulance service for emergency services. The available ambulances are not properly equipped and do not have trained staff and as such are only a means of transportation to the hospitals of urban Lalitpur and Kathmandu.

Key Words: *ambulance, emergency medical service, para-medics, triage*

INTRODUCTION

The sophisticated Emergency Medical Service (EMS) is limited to developed country only. Many developing countries are now slowly developing such system although most services are localized to the urban areas.[1-5] Although inadquate ambulance services are available in the capital city of Nepal but lack effective EMS. The well equipped ambulances with trained paramedics can save many lives during the golden hours of trauma care. For an effective EMS system to be developed the scale of the problem and the existing facilities need to be studied. Therefore, this study is carried out to find out the mode of transport used by the patients attending

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the Emergency Department (ED) of Patan Hospital (PH) and relate this to the triage category of such patients, present status of the EMS system and numbers of ambulances required to serve the patients attending ED in major hospitals of urban city like Lalitpur and Kathmandu.

METHODS

A prospective observational study was conducted in all the patient attending ED of the Patan Hospital from September 1- September 30, 2006. Ethical approval from taken from the hospital. Verbal consent was obtained from the patients and/or competent accompanying relatives before administrating a structured questionnaire. The questionnaire obtained information on the mode of transport, ambulance called or not, accessible road to their house, time to arrival and triage category for every patients attending ED during the study period. The triage category used in PH ED is based on the triage category of the Australasian College of Emergency Medicine. Patients coming after mid-night to 6 am were not triaged and they were labeled as unspecified.

Information on the number of ambulances, trained personnel, availability of oxygen supply and monitors, type of ambulances were obtained from all the ambulance service providers of urban Lalitpur and Kathmandu. The number of patients visiting the ED of all the major hospitals in the urban Lalitpur and Kathmandu, both public and private, were also collected from their record books. The triage category of Patan Hospital was extrapolated to these hospitals to get the figure of triage category of all patients attending the surveyed hospitals. The data and statistical analysis were done by using Microsoft office excel 2003 and statistical package for social sciences version 13 for windows.

RESULTS

The total number of patients were 1964. However, results are based on the valid number of cases; we excluded missing values wherever applicable. The average age of the patient was 27.8 years with a standard deviation of 20.4 years. The median age is 24 years and modal age was 30 years.

The patients with 15-44 years were the most frequent visitors of the PH ED with slightly more males than females (Table 1). The next most common visitors were the children with substantially more females than males. It also shows that 858 male (50.5%) and 868 female (49.5%) patients with a sex ratio of 98.8 were brought to the ED of PH in September 2006. It clearly shows that economically active population (15 -64) are the most frequently brought followed by children (0 – 15) and elderly (65+).

Table 1. PH ED patients by age groups and gender

Age (Years)	Female	Male	Total Number	Percent
0-4	140	101	243	12.4
5-14	135	89	225	11.5
15-44	439	474	914	46.5
45-64	89	128	217	11.0
>=65	65	66	131	6.7
Total	868	858	1726	88.1
Unknown	Sex Ratio = 98.8		234	11.9
Grand Total			1964	100.0

All the patients attending PH ED, only 9.9% arrived in ambulance (Table 2). A 53.6% came in a Taxi followed by 11.4% in private vehicle, 13.5 % in bus, 5.4% in motorbike and the rest 6.2% in other modes of transportation.

Table 2. PH ED patients by mode of transport used

	Frequency	Percent	Valid Percent	Cumulative Percent
Ambulance	192	9.8	9.9	9.9
Taxi	1043	53.1	53.6	63.5
Own	221	11.3	11.4	74.9
Bus	263	13.4	13.5	88.4
Bike	105	5.3	5.4	93.8
Other	121	6.2	6.2	100.0
Total	1945	99.0	100.0	
Missing	19	1.0		
Total	1964	100.0		

The of the patients attending PH ED (87.7%, 1541/1757) did not call for ambulance (Table 3). Of those who called, majority (86.1%, 186/216) came in the ambulance irrespective of whether they had accessible road or not to their residence.

Total 2.7% (52/1940) was of Category I, 20.6% (400/1940) category II, 42.0% category III, 14.3% (277/1940) category IV and 20.4% (396/1940) were unspecified (Table 4). Among thsese only 13.5% (7/52) of category I and 15% (60/400) of category II attended ED in ambulance. Similarly, 9.2% (75/815) of category III, 3.6% (10/277) of category IV and 10.1% (40/396) of unspecified category came in ambulance.

The ambulance was most frequently used (32.8%) from 6 pm to midnight followed by 28.2% from 6 am to 12 noon, 20.6% from 12 mid-night to 6 am and, 18.3% from 12 noon to 6 pm (Table 5).

Table 3. PH ED patients by mode of transport, accessibility of road and called/not-called the ambulance

Called or not called ambulance			Accessible or Not accessible		
			Not accessible	Accessible	Total
Not called	Medium used	Ambulance	0	1	1
		Other medium	181	1359	1540
		Total	181	1360	1541
Called	Medium used	Ambulance	44	142	186
		Other medium	3	27	30
		Total	47	169	216

Table 4. PH ED patients by mode of transport and triage category

			Mode of transport		
			Ambulance	Other medium	Total
Triage categories		N	7	45	52
	Category 1	% within Triage categories	13.5%	86.5%	100.0%
		% within Mode of transport	3.6%	2.6%	2.7%
		N	60	340	400
	Category 2	% within Triage categories	15.0%	85.0%	100.0%
		% within Mode of transport	31.2%	19.5%	20.6%
		N	75	740	815
	Category 3	% within Triage categories	9.2%	90.8%	100.0%
		% within Mode of transport	39.1%	42.3%	42.0%
		N	10	267	277
	Category 4	% within Triage categories	3.6%	96.4%	100.0%
		% within Mode of transport	5.2%	15.3%	14.3%
		N	40	356	396
	Unspecified	% within Triage categories	10.1%	89.9%	100.0%
		% within Mode of transport	20.8%	20.4%	20.4%
	Total	N	192	1748	1940
		% within Triage categories	9.9%	90.1%	100.0%
		% within Mode of transport	100.0%	100.0%	100.0%

Table 5. PH ED patients by mode of transport and arrival time

		Mode of transport		
		Ambulance	Other medium	Total
6 AM - 12 Noon	N	37	483	520
	% within mode of transport	28.2%	33.7%	33.2%
12 Noon - 6 PM	N	24	482	506
	% within mode of transport	18.3%	33.6%	32.3%
6PM - 12 Mid-night	N	43	378	421
	% within mode of transport	32.8%	26.4%	26.9%
12 Mid-night - 6 AM	N	27	91	118
	% within mode of transport	20.6%	6.3%	7.5%
Total	N	131	1434	1565
	% within mode of transport	100.0%	100.0%	100.0%

Direct interviews of the service providers showed that there were 31 service providers with 49 ambulances in the urban Lalitpur and Kathmandu. Of these 45 were in functioning condition. Twenty three ambulances belonged to hospitals which provided limited services like transfer of patients to and from their hospitals and were not open to the public demand. Out of 49 ambulances, 18 had oxygen supply and none had monitors and trained personnel. Seventeen were make shift ambulances (small cars or vans converted to ambulances).

The daily average number of patients attending the ED of all major hospitals of urban Lalitpur and Kathmandu was 720. On extrapolating the triage category of Patan Hospital, there will be 25 in category I, 182 in category II, 383 in category III and 130 in category IV.

DISCUSSION

It has been felt that the ambulance service in Lalitpur and Kathmandu is not effective; however, effectiveness and present situation of the EMS is not clear. This study found that only 12.3 % of those attending ED call for ambulance and only 9.9% used this service. This figure is higher than only the 2% using ambulance in a similar study done in the three major general hospitals of Kathmandu.[6] In the present study even among the patients of triage category I and II, only 13.5% and 15.0% used the ambulance respectively. Though, we did not collect the reasons for people's preference to come to the hospital ED without calling the ambulance, accessibility to their residence was not the factor as 86% had accessible roads. Similarly there were patients who called for ambulance even if they did not have accessible road. This has happened probably due to the lack of confidence of public on the ambulance service.

The available ambulances lacked trained personnel and required facilities. They only serve as a transportation vehicle with no pre-hospital intervention except giving oxygen in some of them. This clearly shows the poor status of the pre-hospital care in urban Lalitpur and Kathmandu.

Although ambulance service ought to be provided for all patients, in the light of limited resources one might ignore category IV patients (N = 130/720). This will leave 590 patients requiring urgent ambulance services. If one ambulance were to make 12 calls per day, 49 ambulances will be required to provide a good quality EMS. Therefore, it is clear that the number of ambulances is not the problem but that there is a lack of coordination to organize the available ambulances effectively with trained paramedics. In the Dutch EMS system, which has a nurse driven triage system both at dispatch level and treatment level, 40% of the calls were triaged so that ambulances did not have to be called out.[7] A study in Sweden also showed that significant percentage of patients transferred in fully equipped ambulances did not require any pre-hospital intervention.[8] Only patients who require pre-hospital intervention could be transported in fully equipped ambulances with trained paramedics; those who require no medical intervention could be transferred in less equipped ambulance and others could attend ED in the public or private transports. Thus dispatch center with trained personnel to triage the calls is needed to address these issues. Such planning could reduce the need for large number of ambulances and still have an effective EMS without reduction in safety for the patients.

One of the limitations of the study was the patients attending the ED from mid-night to 6 am were not triaged leading to some bias in the triaged categories. Moreover, as this study only looked at the pattern of ED attendance in a single general hospital, mode of transport used and triage categories of the patients could be different in other hospitals.

CONCLUSIONS

This study shows that only a minority of patients attending hospitals on emergency basis call for ambulance and majority make their way in vehicles other than ambulance precluding any pre-hospital intervention even for triage category I and II patients. The available ambulances are not properly equipped and do not have trained staff and as such are only a means of transportation to the hospitals of urban Lalitpur and Kathmandu. We need to improve EMS in the urban cities of our country. The concern authority has to take the initiative to save the lives of our own people.

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