



AJMHR

Asian Journal of Medical and Health Research
Journal home page: www.ajmhr.com

Modeling Road Accident Trauma Management System Across NH-37 (New NH-27) Jalukbari to Khanapara Stretch of Assam

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ABSTRACT

Road accident is a major global public health problem across the globe. Every minute an accident is taking place in India, in each 3.5 minute a person died in India due to road accidents. There is no difference in Assam too. NH-37 (New NH-27) is also seeing a high number of accidents. In order to find out a solution to decrease the mortality and morbidity due to road traffic accidents this study is conducted on modeling trauma management system across NH-37 (New NH-27) taking a strip of highways from Jalukbari to Khanapara. Extensive literature survey is done using primary as well as secondary sources. Possibility of entrepreneurship prospects has been studied. Market study is being done. Cost benefit analysis is being done. Financing options are also being explored. Present status of health care establishments and their facility assessment near the highways is being explored.

Keywords: Road accidents, Trauma management, Entrepreneurship, facility assessment.

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Received 19 January 2018, Accepted 11 February 2018

Please cite this article as: Sharma A *et al.*, Modeling Road Accident Trauma Management System Across NH-37 (New NH-27) Jalukbari to Khanapara Stretch of Assam. Asian Journal of Medical and Health Research 2017.

INTRODUCTION

Road accident is one of the leading causes of mortality and morbidity in the globe. 1.2 million people die each year because of road accidents across the globe. It is projected to be 5th leading cause of death by 2030 [1].

India is not an exception. Each minute an accident is taking place. In each 3.5 minute a death occurs. It is the leading cause of death amongst the age group of 15-29 years of age group. World health organizations (WHO) has take an agenda for sustainable development by which it aims to reduce 20% accidents by 2030.[1].

In Assam, situation is not an exception to it. The following TABLE 1 depicts the road traffic accident death in comparison to India [2].[3]

Table 1

Country/State	2011	2012	2013	2014	2015	2016
India	142,485	138,258	137572	139671	112502	122014
State	2342	2291	2411	2522	2397	2572

Guwahati is the state capital of the Indian state of Assam and it is the gateway of the north east India. National highways (NH-37) which is now renamed as National highway (NH-27) passes through it. It provides entrance to the North east India and also connecting only operational international airport of Assam-Lokapriya Gopinath Bordoloi international airport and also to interstate bus terminus of guwahati. Guwahati is having population of 962334 [4]. Many leading schools and colleges as well as universities are being set up along these highways. Phenomenal growth of vehicular traffic has been observed in this highway. This strip of NH37 bifurcates at jorabat and lead NH54 to shillong, captal city of Meghalaya and main strip goes up to saikhowaghat and now extended up to rowing. The NH 27 runs from Porbandar to Silchar, this is the second largest national highway of India. High Accident rate is observed in this highway and hence mortality and morbidity too. The number of fatal accidents of last three years till first quarter of 2017 [5] across different segments are shown below (TABLE 2) in this stretch of highway.

Table 2

Jalukbari to Somnath Tatelia	69
Tatelia to Boragain	39
Boragaon to Ahomgaon	41
Ahomgaon to Sarusajai	71
Sarusajai to Basistha	114
Basistha to Khanapara	112

It is observed that in Sarusajai to Basistha segment the accident are highest followed by Basistha to Khanapara.

Though number of government as well as private hospitals is being set up across or near highways in this strip but still mortality and morbidity is high.

So, In order to find out a solution to decrease the mortality and morbidity due to road traffic accidents this study is conducted on modeling trauma management system across NH-37 (New NH-27) taking a strip of highways from Jalukbari to Khanapara. Extensive literature survey is done using primary as well as secondary sources. Market study is being done to find out possibility of entrepreneurship. Cost benefit analysis is being done. Financing options are also being explored. Present status of health care establishments and their facility assessment near the highways is being explored.

Literature review

Land transport authority of Singapore [6]. Stressed on implementation of innovative and smart mobility solutions, to develop its standard and its adaptation. They give importance on to establishing co partnership and co creation. It focuses on developing well integrated and sustainable land transport system by 2030. They stressed importance of collaboration between public, industry and Academicians as well as researchers. In Intelligent transport system(ITS) [7], there are advanced driver assistance system, Intelligent speed adaptation, driver warning system, collision warning and avoidance system, lane keeping and lane change system, visibility enhancing system, seat belt reminder system etc .They found benefit and safety impact of ITS and stressed its importance in developing countries. South Africa implemented ITS and they are very much positive on its usefulness .In Iraq[8] a study showed that significant reduction of mortality was observed when non graduate paramedic was employed in care of trauma victims. The is need of community clinic also along side of roads done road safety and accident. In Bangladesh[9] a study done in Sylhet region of Bangladesh reiterated its need. The study had overview of road traffic accidents (RTA) of that region and degraded road safety situations. It is tried to identify accident prone roads and spots, drivers and pedestrians conditions. He explored safety priorities and options available in Sylhet. He studies the effect of accidents on Society. It was found that sylhet –Dhaka road is the most hazardous and Sylhet Sadar thana road is more vulnerable for road traffic accidents. He has recommended for increase in highway police, mobile court, awareness amongst children for accidents, strict law enforcement, checking of drivers etc before starting vehicle. Questionnaire and secondary data survey was done from 2005-2007 from civil surgeons office and newspaper called "Sylheter Dak".

Entrepreneurship movement in trauma care

Social entrepreneurship is the use of the techniques by start up companies and other entrepreneurs to develop, fund and implement solutions to social, cultural, or

environmental issues [10]. This concept may be applied to a variety of organizations with different sizes, aims, and beliefs [11]. Social entrepreneurship typically attempts to further broad social, cultural, and environmental goals often associated with in areas such health care and community development [12]. We can extend it to trauma care aspects also. There are different stakeholders associated with it. Unless we develop coordinated task force for this care with mass involvement of community one will not be able to solve this problem. There is scope of huge employment generation and employment scope exists in this area. With this aim a feasibility study is being conducted in guwahati for setting up of a basic trauma care unit so that one can save the golden hour of trauma care after road accidents.

Objectives of the study-

1. To find out the facility readiness of the health centres across the highways
2. To study the scope of entrepreneurial prospect of setting up of a basic trauma care unit
3. To propose a model of trauma care across the National highways.
4. To improve the present scenarios of mortality and morbidity due to road traffic accidents.

METHOD

Random survey was done on the month of November 2017 on two hospitals in Jalukbari to khanapara strip to find out facility readiness of trauma care. Cost benefit analysis was also done for setting up a basic trauma care unit by doing extensive market surveys from local vendors, market places as well as from national and international suppliers. Financing options also being explored by contacting local banks.

RESULTS AND DISCUSSION

Facility Readiness

Types of Inquiries/Questions	Hospital A	Hospital B
Life support training	Only Anesthetist	Anesthetist and one emergency doctor
Participation in training	Poor	Poor
Skill up gradation incentive	Nil	Nil
Community awareness drive	Nil	Nil
Ready availability of specialist with promptness in case of major surgery at night for accident cases	Yes	Nil
Availability of radiologist at night	Nil (Only Technician do CT Scan)	Nil (Only Technician do CT scan)
Receiving cases from periphery without life support measures	Almost always	Almost Always

Cost benefit analysis of setting up a basic trauma care unit-[13]

Fixed Cost(Minimum)	Variable cost(Minimum)
Approx.1355000 (Equipments and Ambulances)	Approx.150000/month-(Doctors/Nurses/Technician/ Room Rent/Disposable items/Medicines)

Benefit-

At present patient have to bear 400 rs in most hospitals in guwahati for emergency care and 10-30% margins are there in medicine and disposable items

Financing options

Bank loan, Public Private Partnership, Government can fund by levying a percentage of tax from road or car users

Area of Proposed model

To propose a model, extensive survey of accident statistics, onsite inspection of vehicular movement and quality of intersection as well as dividers are noted. Secondary surveys are done regarding black spots and accident prone zones on these strips of NH 27. Whole strip is divided into six segments with three km each (Table 2).One basic trauma care centers can be proposed for accident black spot area and one information centre in each strip can be set up. Black spot is a place on a road that is considered to be dangerous because several accidents have happened Accident black spot is a place where road accidents are historically been concentrated.[13]. It may occur due to various reasons, such as sharp drop or corner in a straight road concealing the oncoming traffic, a hidden junction in a fast road, poor or concealed warning side at a cross roads[13]. More than 700 black spots are there across the country is being classified as per ministry of road transport and highways, India. [14]. As per WSI [weighted severity index method] $(41 \times F) + (4 \times GI) + (1 \times MI)$, where F is fatal injuries, I is grievous injuries and MI is minor injuries [15]. Sarusajai to basistha chariali portion amongst our study strip is having highest possible black spot. So, sarusajai and basistha area this study is proposing a basic trauma care unit. Like this we can segment the whole highways of NH 27 that passes through Assam say in 20 km each and in areas with maximum black spot, we can set up a such basic trauma care unit

Recommendations

Basic trauma care unit is to set up at definite interval on the areas of maximum black spots across national highways

Huge employment generations scope is there

Government should seriously think of it

Financial institutions should seriously think on it

Educational institutions-Health care and Management with all stake holders of traffic accidents should work collectively

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