



Role of emergency department of a super specialty government hospital during a seasonal dengue epidemic in a developing country: A conundrum

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ABSTRACT

Main objectives of this study were to establish the role of the emergency department of an exclusive super specialty tertiary care hospital during a seasonal epidemic such as dengue and to further estimate the opportunity cost involved in treating such dengue patients. Retro-prospective six months study at the Emergency Receiving Station of a Super Specialty Government Hospital was done in India. 294 dengue patients were managed during the study period. 38% of these were cured in the Emergency Department itself where the treatment was given by an Emergency Medical Officer, a plain medical graduate. The average retention period of the dengue patients was significantly higher than that of the rest of the patients visiting the emergency ($p=0.001$). Treatment of the 294 dengue patients was achieved at an opportunity cost of 8 genuine super-specialty emergency patients per day. Dengue, being a seasonal epidemic in the developing world, assiduous measures are imperative to prevent any such recurrence. Health authorities should be more proactive to preclude such a situation, detrimental to the very concepts of regionalization of the healthcare delivery system and should disseminate correct timely information to the public vis-à-vis availability and requirement of medical services during such seasonal epidemics.

Key-words: Emergency Department, Super Speciality Hospital, Dengue, Opportunity Cost, Developing Country

INTRODUCTION

Overcrowded Emergency Departments (EDs), prolonged waiting times and patient care delays are common themes in current urban emergency medicine throughout the developing world.¹ Patient's average retention period is a key measure of ED throughput and a marker of overcrowding. Studies have shown that overcrowding, prolonged waiting times, and protracted average retention period in the EDs increase the proportion of patients who leave without being seen by a physician.²

In Emergency, the service is to be rendered with speed and accuracy, and the priority doesn't depend upon the time of arrival of the patient but on the seriousness of the disease.³

Time study analyses of ED care processes are potentially useful quality improvement tool and will help clarify and quantify the causes of patient care delays.⁴ Improved ED management processes can significantly decrease the average retention period of the patients visiting the emergency departments.⁵ Integration of clinical decision units into the emergency departments can be a step forward in this direction, though it is a very complex process.⁶ However, in the present

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scenario around 30 percent of the emergency patients die before they are rushed to the hospital and over 80 percent of the accident victims are denied timely medical care.⁷ Research indicates that overall service satisfaction in the ED is a function of patient satisfaction with the physician, with the waiting time and with the nursing service.⁸ A study at the Cooper hospital in New Jersey suggested that a reduction in waiting time led to increased patient satisfaction in the ED.⁹

It is essential that hospital and health services be planned on a wide-area basis; planning on an individual or local community basis creates gaps and overlapping. Certain expert advisory services can thus be organized to advantage only on a regional or sub-regional basis. It is equally imperative to ensure that these roles are stringently followed as far as possible.¹⁰ Opportunity cost is the benefit foregone on the immediate next best alternative in a given decision making situation. In other words, when a resource is available and when it can be utilized in more than one way, the best way of utilizing that resource can be decided only after giving due consideration to the concept of opportunity cost.¹¹

The present study was done in the emergency department (Emergency Receiving Station; ERS) of the Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGIMS), Lucknow, India in the background of the dengue epidemic in the area. SGPGIMS is an 868 bed tertiary care super specialty hospital without any basic medical sciences specialties such as General Medicine, General Surgery, Ophthalmology, Orthopaedics etc. The institute caters to approximately 3,00,000 outpatients and 35,000 inpatients per year. On an average, in a year, about 7,000 surgical procedures are performed including more than 80 renal transplants. This is made possible by a team of highly dexterous doctors using state of the art technology and high-end sophisticated equipments. The ERS has 30 emergency beds and is manned by round the clock team of adroit

Emergency Medical Officers (EMOs). It receives around 30-40 patients daily.

Objectives of the Study

The main objectives of the study were to establish the role of the emergency department of a tertiary care hospital, without basic medical sciences facilities, during a seasonal epidemic such as dengue and to further estimate the opportunity cost involved in treating such dengue patients.

MATERIALS AND METHODS

A retro-prospective study of the ERS was carried out at the SGPGIMS over a duration of six months (July to December 2012) coinciding with the seasonal dengue epidemic in the area. The number of patients reporting to the ERS was collected from the admission-discharge register to get an insight on the overall workload of the ERS. The number of dengue patients treated at the SGPGIMS along with their clinical outcomes was studied by going through the medical records. The average retention period (in hours) of the dengue patients as well as of the rest of the patients in the ERS was calculated, and student t-test was applied [after testing for normality of the distribution (Kolmogorov-Smirnov test)] to determine whether there was any significant difference between the two. SPSS 16 software was used for the same. The difficulties faced and the strategies developed by the hospital administration to accommodate the massive influx of dengue patients were studied holistically. Finally, the opportunity cost, in terms of the quantum of genuine specialty patients denied treatment, involved in treating these dengue patients was calculated.

RESULTS

The study revealed that the ERS treated 6,245 patients during the study period of six months. Out of these 6,245 patients visiting the emergency, 294 were dengue patients (~5 percent). The month-wise trend of patients visiting the ERS during the study period is shown in Figure 1.

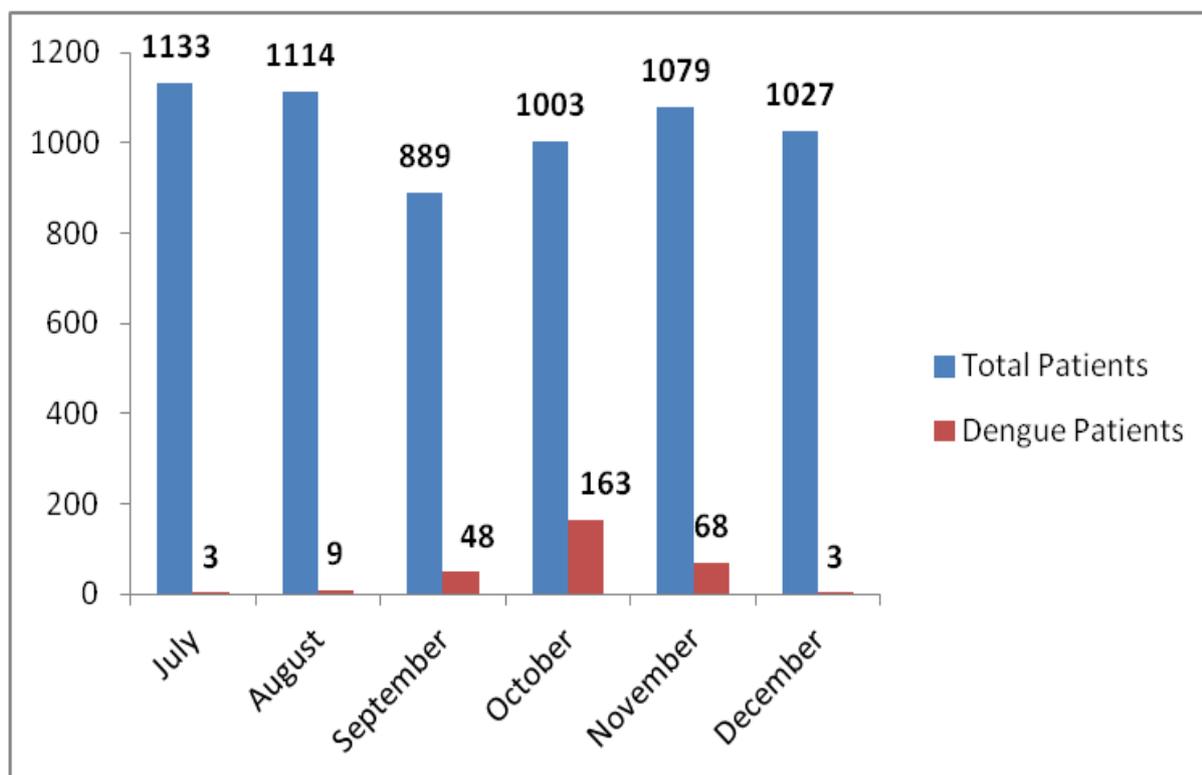


Figure 1. Month-wise trend of patients visiting the emergency department of the hospital during the study period of six months (July to December 2012)

To deal with this influx of dengue patients, SGPGIMS administration made a valiant attempt to fulfill its social and ethical obligations of treating all patients visiting the emergency department. However, at the outset, it was an arduous task due to many reasons. The situation was abysmal as no prior forecasting was done especially in view of similar dengue epidemic in Lucknow city last year.

No proper communication via mass media was done by the district health authorities to the public vis-à-vis various easily accessible treatment options for dengue available to them in the city itself rather than availing the facilities at SGPGIMS, situated more than 9 miles from the city centre. As most of the dengue patients congregated at the SGPGIMS itself, beds earmarked for super specialty patients were occupied by dengue patients.

Dengue being a systemic disease coming under general medicine, it was hard to accommodate these patients in any department except Hematology. Hematology, being a rare branch

with limited resources, thus faced astronomical workload. Dengue patients reporting to ERS, at times, remained untreated due to increased workload. Still they were not ready to leave as they felt safer at SGPGIMS vis-à-vis other healthcare providers. At times, more than 30% of the 30 ERS beds were occupied by dengue patients leading to large number of genuine super-specialty patients being refused admission. As the ERS was fully saturated with patients, many unattended super specialty patients waited for 16-18 hours for admission to the ERS.

Frequent altercations between healthcare providers and the patient parties were widespread. Once the situation further deteriorated, the hospital administration galvanized as various policies & procedures were drawn. Total conformance was ensured and prompt follow up action was advocated. From time to time, hospital administration issued/ updated Standard Operating Procedures (SOPs) in the form of circulars in liaison with various committees to streamline the functioning of the ERS. The EMO on duty provided the primary

resuscitation care and then the dengue patients were transferred to any of the available medical super specialty wards after the designated senior resident had examined the patient. Target was to minimize the retention period of these patients in the ERS.

The number of EMOs was increased to assuage the increased workload. Further, efforts were made to make extra-beds available for dengue patients by internal reallocation viz. 6 beds in Endo-medicine and 4 beds in Immunology wards were earmarked for the same. Dengue is a medical problem and not a hematology problem per se. Therefore, once the 10 earmarked beds were occupied, beds in other wards with medical backgrounds were also utilized to provide care to the dengue patients. Thus, pressure on ERS & Hematology departments was partially alleviated. However, Dengue patients admitted in wards other than ERS faced lot of difficulties in getting proper care as communication gaps galore with regard to the doctor actually responsible for

treating these patients. This situation further deteriorated as many of these patients were not admitted through the Hospital Information System protocol.

Many times, hospital administration used to remind the treating doctors to visit the wards occupied by their dengue patients. With time, the system was streamlined as doctors were made to admit the dengue patients in their own wards. However, sporadic cases of misunderstanding continued till the very last. All these assiduous attempts on the part of hospital administration yielded flabbergasting results as more than 90% of the dengue patients were cured and discharged.

Figure 2 shows the treatment outcome of the 294 dengue patients treated at the SGPGIMS during the six month epidemic. Only 17 patients died out of a total of 294 patients. Most of these 17 patients were brought to SGPGIMS in a very critical state.

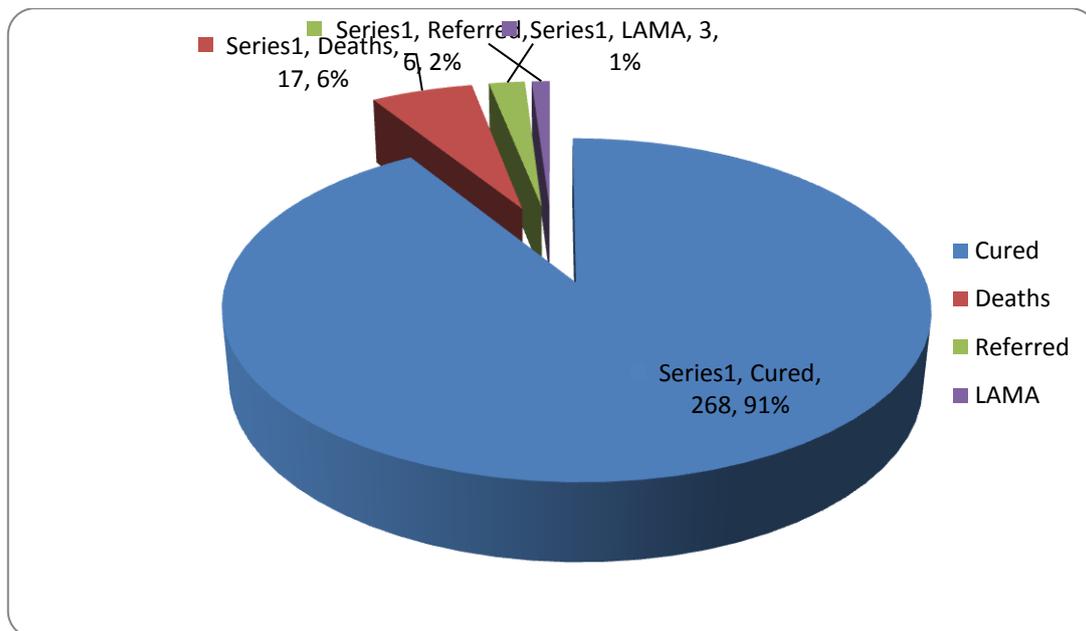


Figure 2: Treatment outcome of the 294 dengue patients treated in the hospital during the study period of six months (LAMA: Left against Medical Advise).

Figure 3 gives comparison between the those treated in the inpatient wards of the hospital.

numbers of dengue patients treated at ERS versus

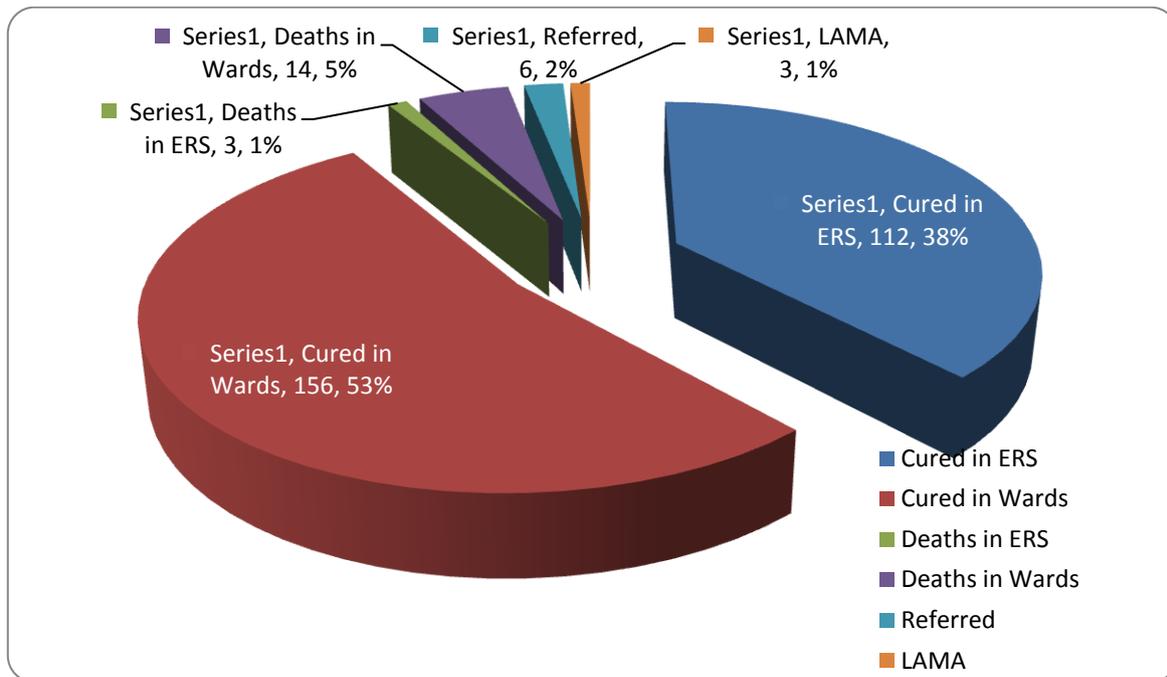


Figure 3. Number of dengue patients treated at the emergency department versus those treated in the inpatient wards of the hospital

The average retention period of the 294 dengue patients in the ERS was found to be 25 hours 40 minutes (25.67 hours). The same for the remaining patients visiting the ERS was found to be 5 hours 20 minutes (5.33 hours). Student t-test gave a significant p value (0.001).

The opportunity cost involved in treating these dengue patients was calculated as under:

The average detention period of dengue patients (in hours), as mentioned above, was taken as 25.67 hours.

The average detention period of the remaining patients visiting the ERS was taken as 5.33 hours.

Therefore total hours consumed by the dengue patients in ERS = 25.67×294
= 7546.98 hours

Therefore opportunity cost will be (for the whole study period) = $7546.98 / 5.33$
= 1415.94

Finally, opportunity cost per day = $1415.94 / 184$
= **7.69 genuine emergencies per day**

DISCUSSION

Dengue is a systemic disease that can be treated by a general physician; it's not a blood dyscrasia. Thus, super specialty setups like SGPGIMS having

hematology department have no distinct advantage in treating these patients.

Patients from the periphery coming to SGPGI for the dengue treatment actually negate the advantages of the concept of regionalization as advocated by the World Health Organization.¹⁰ Unlike blood dyscrasias viz. various leukemias, aplastic anemia, bone marrow depression due to radiotherapy or chemotherapy etc. in which the changes in blood component are permanent, management of a systematic manifestation like dengue doesn't need a specialized department like hematology. Treatment of dengue patient is only supportive, until and unless there is marked thrombocytopenia (less than 20,000 per cubic centimeter). Even in this clinical scenario, management can be done through platelet infusion, which can be done by any specialty hospital having a medicine fraternity. The very fact that 38% of these dengue patients were cured in ERS itself, where the treatment is given by EMO, a plain medical graduate, adds credence to the premise that dengue is a systemic disease that can be effectively treated by a general physician.

The average retention period for the non-dengue patients visiting the ERS was found to be 5.33

hours which is comparable to the figures calculated in similar settings worldwide. A recent study reports that the average retention period in Emergency Departments across USA is 3.7 hours with approximate higher limits of 5 hours in states of Maryland and Arizona.¹² However, the student t-test clearly indicates that the average retention period of the dengue patients was significantly higher than that of the rest of the patients visiting the ERS at SGPGIMS. Thus, it is clear that the treatment of these dengue patients was done at an astronomical opportunity cost. Actually, during the study period of six months, the emergency department at SGPGIMS might have turned down more than 1400 genuine super-specialty emergency patients. What happened to these genuine super-specialty emergencies is a topic warranting separate debate! Besides, many unattended super specialty patients waited for 16-18 hours for admission to the ERS raising medico-legal, social and ethical ramifications. Clinical outcomes of these dengue patients validate that SGPGIMS never abdicated its social and ethical obligations. However, the treatment protocol required for these patients could have been easily followed with similar outcomes at any secondary care facility except in rare medical emergencies such as hemorrhagic shock.

LIMITATION OF THE STUDY

The present study showcases the results of one single tertiary care government hospital in Indian subcontinent. It is the only hospital of its kind in the entire country of more than a billion population that boasts of only the super-specialty branches with no basic medical specialties like internal medicine, general surgery etc. to support them. Hence the results of this study can't be generalized until and unless similar healthcare facilities in the developing world share their experiences during such seasonal epidemics. As there is, at present, paucity of evidence based research involving similar scenarios and perspectives, the exact role of the tertiary care super specialty hospitals during epidemics in third world countries will remain debatable.

CONCLUSION

Dengue being a seasonal epidemic, this is the ideal time to obviate recurrence of any such incidence elsewhere. At the outset, it is imperative that all relevant facts should be shared with the concerned government health authorities so that proper communication to the public, preferably

via mass media, vis-à-vis various easily accessible treatment options available to the patients for dengue in the secondary care facilities, can be initiated. It should be further conveyed to the indigents that super specialized setups such as SGPGIMS have no advantage over the secondary care units in treating most of these patients. All hospitals and healthcare providers in the area should also be sensitized with regard the same. As a perspicacious measure, institutions such as SGPGIMS should also learn from experience and further bolster their standard operating procedures vis-à-vis acceptance/reference of such patients once immediate medical care is rendered. These institutions should also consider disseminating relevant information directly to the public via timely planned press releases. Super speciality tertiary care hospitals/ public health authorities throughout the developing world should learn from this experience and should be more proactive in order to preclude recurrence of any such abject scenarios in their countries involving similar settings.

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