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Emergency (108) Calls To The Ambulance Service In The State Of Gujarat (India) That Do Not Result In The Patient Being Transported To Hospital: An Epidemiological Study

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ABSTRACT

Objective: To describe the demographical and clinical characteristics of the patients who are not transported to the hospital after an emergency (108) call to the Gujarat EMRI emergency response center, the reason for non-transportation, and the priority assigned when the ambulance is dispatched.

Methods: All non-transported patients from 1st December 2008 to 28th February 2009 were identified from the ambulance service command and control data. Epidemiological and clinical data were then obtained from the patient care record which was completed by the attending emergency medical technician (EMT) and were compared with the initial critical code that determined the urgency of the ambulance response.

Results: Data were obtained for 22186 patients who were not shifted during the study period. Less than one per cent of these calls were labeled critical (the most urgent category) at the time when the call was received. Trauma (vehicular) accounted for 30.3% and pregnancy related emergency cases accounted for 16.1% of all non-transported calls. These group of patients were predominantly young adults (between 20 to 30 yrs old) and the majority (more than 99%) were identified as less urgent (non critical) at telephone triage. The mean time that an ambulance was committed to each non-transported call was 2hrs 67 minutes per day.

Conclusions: This study shows that trauma (vehicular) accounted for a significant proportion of non-transported 108 calls inspite of assigning a high priority status when the call is first received. There could be major gains if some of these patients could be triaged to an alternative response, both in terms of increasing the ability of the ambulance service to respond faster to clinically more urgent calls and improving the cost effectiveness of the health service. Classifying calls into critical and non critical for the dispatch system has been shown to be sensitive, but this study suggests that its specificity may be poor, resulting in rapid responses to relatively minor problems. More research is required to determine whether such prioritisation can reliably and safely identify 108 calls where an alternative to an emergency ambulance would be a more appropriate response.

Key Words: emergency 108 calls; ambulance services; priority dispatch systems; telephone triage

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Each year, in the state of Gujarat (India), a large number of emergency (108) calls received by ambulance services do not result in a patient being transported to hospital. These calls have implications both in terms of how rapidly an ambulance can respond to other emergencies and the efficiency of service delivery [1]. To date, little has been published on this group of 108 calls.

Chen et al[2] reported from Taiwan that 32% of all ambulances dispatched, led to no patient being transported. In the United States, Hipskind et al [3] found 30% of ambulance responses resulted in the patient refusing transportation. These patients were commonly asymptomatic, were in the 11–40 year old age group and were involved in motor vehicle accidents. However, this study did not investigate calls where the ambulance crew decided not to transport the patient and differences in the organisation and delivery of emergency health care may limit the relevance of such findings in the UK.

Currently, in England and Wales, 17% of the patients are not conveyed to the hospital after an emergency ambulance has attended a 999 call [4]. Ambulance services are not required to transport all patients to an accident and emergency department [5] and the Department of Health has now permitted careful piloting and evaluation of alternative ways of responding to the least serious (category C) emergency calls [6] . While this has resulted in considerable interest in implementing service developments, till date, no ambulance operator in India has carried out an audit of non-transported calls.

Several studies have investigated the inappropriate use of the emergency ambulance service in the UK and have provided estimates ranging from 16% to 52% [8],[9],[10],[11]. Victor et al [8] recently studied one week's calls to the London Ambulance Service and reported that while the majority of calls required a 999 response, 40% could have been dealt with by primary care, psychiatric services or social services. Non-transported calls (20%) were not identified as a separate category in this research, but it might be anticipated that a significant proportion did not need an emergency ambulance response.

Priority based dispatch systems have been introduced by nearly all ambulance services in the UK and are designed to match the urgency of the ambulance response to the clinical needs of the patient. The Advanced Medical Priority Dispatch System (AMPDS) [12] uses structured protocols and systematic questioning of the 999 caller to assign a series of alpha-numeric codes and it is currently being used by over 75% of ambulance services.

In this study, we describe for the first time in India, the epidemiology of the group of patients who were not transported to the hospital after an emergency (108) call, the priority assigned at that time, and the reasons for non-transportation.

Methods

Non-transported cases were defined as those cases where a 108 call was made and an ambulance from any one of the 400 ambulance stations of the Gujarat EMRI attended the scene, but the patient was not conveyed to the hospital. Cases where the patient was dead before the arrival of the ambulance and those where the call was malicious were excluded. The computer databases that hold both the Command and Control data and information scanned routinely from patient care records completed by the ambulance EMTs [14] were searched to find the first 500 non-transported cases starting from 1st December 2008. The sample size was determined to provide the 95% confidence limits of ±5% for each variable with an allowance made for missing data. The patient report forms for these cases were further examined by manual inspection. Clinical categories were attributed to each case after examination of the free text description of the incident which was recorded on the patient care

record. Each case was categorised by two researchers (AP and RR) using a system devised by the authors. Where there was disagreement about categorization, the case was discussed and a consensus was reached [Table/Fig 2].
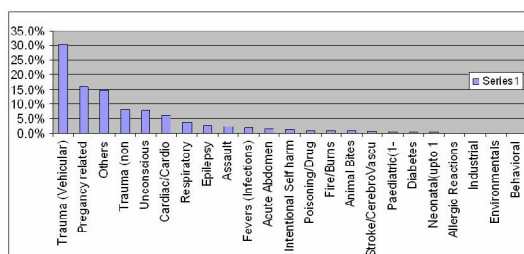

(Table/Fig 2) Clinical categories of non-transported patients

The data collected, comprised of age, sex, type of residence, critical / non critical case assigned by the emergency response center, clinical category, whether patient had been drinking alcohol and the reason for which the patient was not transported to the hospital. The time for which each ambulance was committed, was also calculated. This was taken as the interval between the time when the call was being passed on to the ambulance crew and the time when they became available to respond to another call.

Proportions, means, medians, and 95% confidence intervals were calculated using SPSS for Windows version 9.0.

Results
In 22186 cases where data were extracted from the patient report forms, the age distribution [Table/Fig 1] showed a distinct peak in young adults in the age group 21 to 30 yrs. Men accounted for 63.8% of the cases studied.
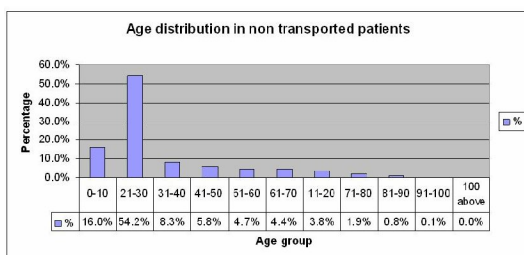
(Table/Fig 1) Age distribution of all non-transported patients.

[Table/Fig 3] shows the reasons for non-transportation. In almost half of the cases, the reason was recorded as no emergency / first aid, in a quarter of the cases, it was recorded as the refusal to travel, and in the rest, the patient was already shifted before the arrival of the 108 ambulance. Trauma (vehicular) was the commonest clinical category for both the refusal to travel (56%) and the no injuries (51%) groups, whilst general assistance (13%) was the largest category where the reason for non-conveyance was that a GP visit had been arranged.

Criticality codes were available for 16196 (73%) of the cases. Of those with codes available, 213 (0.8%) were critical cases (the most urgent code) and the rest 15983 were non critical cases. The mean time for which the ambulance was committed was 2hrs and 67 minutes per day and a median of 2hrs and 33 minutes (standard deviation 17 minutes, interquartile range 24–43 minutes).
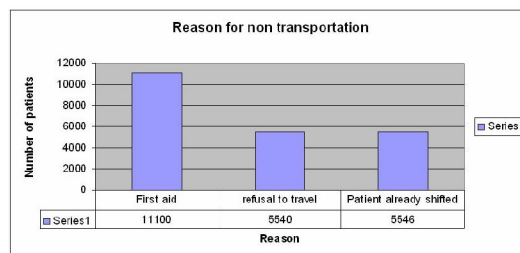
(Table/Fig 3) Reason for non-transportation given by ambulance crew

Trauma (Vehicular)
Trauma (vehicular) accounted for 6733 (30%) of the non-transported calls. The mean age of non-transported cases presenting with falls was 19 years (median 18 years, SD 20, interquartile range 68–86 years).10592 (31.78%) cases were males and 6% were linked to alcoholism.

Discussion
This is the first Indian study to describe the epidemiology of non-transported 108 calls and to link these data to the criticality code used to determine the priority of the ambulance service response. However, there

are a number of limitations in the study design.

There was no independent validation of the clinical assessment made by the ambulance crew nor did this study follow up non-transported patients to establish the clinical outcome after the ambulance left the scene. In addition, only few criticality criteria were recorded by the crew after they had attended to the patient and so no comparison could be made with the initial code assigned by the call taker. Therefore, it was not possible to confirm from our data whether the decision of not transferring the patient to the hospital was appropriate or to analyse whether the urgency assigned to the call by the emergency response center was justified by the clinical need.

Clinical data on the nature of the incident could not be easily extracted from the routine computer database. Therefore, the authors had to develop their own coding system to categorise the free text description of the incident on the patient report form and this limited the comparison between our survey and other published research. Manual inspection also introduced possible observer error into the study findings, but this was minimised by two of the authors by independently categorising each call.

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