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Does in-hospital trauma mortality in urban Indian academic centres differ between "office-hours" and "after-hours"?

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A R T I C L E I N F O

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A B S T R A C T

Introduction: Trauma services within hospitals may vary considerably at different times across a 24 h period. The variable services may negatively affect the outcome of trauma victims. The current investigation aims to study the effect of arrival time of major trauma patients on mortality and morbidity.
Method: Retrospective analysis of the Australia-India Trauma Systems Collaboration (AITSC) registry established in four public university teaching centres in India Based on hospital arrival time, patients were grouped into "Office-hours" and "After-hours". Outcome parameters were compared between the above groups.
Results: 5536 (68.4%) patients presented "after-hours" (AO) and 2561 (31.6%) during "office-hours" (OH). The in-hospital mortality for "after-hours" and "office-hours" presentations were 12.1% and 11.6% respectively. On unadjusted analysis, there was no statistical difference in the odds of survival for OH versus AH presentations. (OR,1.05, 95% CI 0.9-1.2). Adjusting for potential prognostic factors (injury severity, presence of shock on arrival, referral status, sex, or extremes of age), there was no statistically significant odds of survival for OH versus AH presentations (OR,1.02, 95%CI 0.9–1.2).ICU length of stay and duration of mechanical ventilation was longer in the AH group.
Conclusion: The in-hospital mortality did not differ between trauma patients who arrived during "after-hours" compared to "'office-hours".

1. Introduction

Trauma is a leading cause of mortality in low-and-middle income countries (LMICs). [1] LMIC hospitals frequently encounter large patient loads with a limited workforce, potentially contributing to excess mortality compared to mature, high-income country (HIC) trauma systems. [2,3] Similar to hospitals in HICs, LMIC hospitals have varying numbers of healthcare providers available throughout the week, with more staff on-site during the day ("office-hours") and lesser staff overnight and on weekends ("after-hours") [4].

It is intuitive that more care providers, the presence of senior care providers, and differences in patient load and care processes between "office-hours" (OH) and "after-hours" (AH)would result in better outcomes for the patients arriving during OH. Differences in outcomes have been reported in many countries, across a range of medical services, disease processes, and age groups [5-13], though this data is mixed and with considerable nuance, [14] has not been definitively explored in LMIC trauma patients. A previous single centre study from an

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LMIC did show a difference in mortality for patients being admitted to a level 1 trauma centre during OH and AH despite similar patient processes of care [13],

In this study, we investigate patient outcomes in trauma patients arriving during OH compared to AH across an Indian multicentre trauma registry that spans four trauma hospitals in three large cities. We hypothesize that the arrival of acute trauma patients during OH would be associated with better outcomes compared to AH, accounting for differences in injury severity, the presence of shock on arrival, referral status, sex, or the extremes of age.

2. Methods

2.1. Setting and study design

The present study is an analysis of prospectively collected data from the Australia India Trauma System Collaboration (AITSC) trauma registry [15]. The AITSC registry involved four major Indian trauma hospitals across three large urban centers; the Jai Prakash Narayan Apex Trauma Centre (JPNATC) and Guru Teg Bahadur (GTB) Hospital, both in New Delhi; the Lokmanya Tilak Municipal General Hospital (LTMGH), Mumbai; and the Sheth Vadilal Sarabhai (VS) General Hospital, Ahmedabad. Two centres have designated "Emergency Departments" staffed by ED physicians while the other two have "Casualty" areas manned by physicians from ancillary departments. JPN Apex Trauma Center is a dedicated level 1 trauma center located in national capital Delhi attached to All India Institute of Medical Sciences. It has 235 beds exclusive for trauma victims. It has a triage system for trauma patients with dedicated emergency physicians and trauma surgeons available in ED. Medical facilities consist of six states of the art operating theatres, 178 inpatients, and 30 Emergency (ED) beds, including 32 ICU beds to provide both in-hospital and emergency care. VS hospital caters to areas in and around Ahmedabad with an average radius of 180 km. Being near to the national highway, VS hospital is the center for significant trauma management. Moreover, it is the only government hospital in Ahmedabad which caters to vascular injuries (limb salvage). It has significant patient input by emergency 108 services in Ahmedabad. It has 1115 beds and has a separate Emergency department for trauma patients. The main strength of Lokmanya Tilak Municipal General Hospital has been the efficient 'Trauma Care Centre' and emergency Medical services center with state-of-the-art equipment and facilities. It was the first Trauma Service in India, which has been on a constant 'state of alert' for disasters. This hospital is a nodal center amongst the medical services of the Disaster management plan in the civic context. G.T.B. Hospital has 1700-beds capacity. It is the only Delhi Government tertiary care hospital in Trans-Yamuna (East Delhi) area, catering to the East Delhi population as well as patients from adjacent states. It is an associated teaching hospital attached to the University College of Medical Sciences, University of Delhi.

All the participating centers have the support of surgical and non-surgical specialists from other disciplines, neurosurgery, orthopedics, vascular, reconstructive and plastic surgery, anaesthesiology and critical care, radiology, laboratory medicine, and forensic sciences.

The trauma patients are primarily attended by surgical disciplines along with emergency physicians(in two sites). Resident doctors are available 24 h at all sites while faculty support is variable. At JPN Apex Trauma Centre during OH, five resident doctors and one faculty are available; during AH four resident doctors and faculty are on call. In Sion hospital, which provide trauma services as a part of surgical services, the department strength varies from 18 faculty and 50 residents during OH to 1 faculty and 10 resident during AH. However, most faculty members and residents provide elective services during OH while two residents and one faculty manage trauma cases. AH, the one faculty, and 10 residents provide all emergency services. A similar pattern is followed in GTB hospital where trauma services are delivered as a part of general surgical services. There are 9 consultants and 70 residents overall. However, the trauma services during OH is managed by two residents and supervised by one faculty while AH trauma services are attended by four residents and supervised by one faculty on call. At VS general hospital, staffing pattern for trauma services is also part of larger general services. The trauma is attended by emergency physicians and surgeons. Faculty members are present during hours along with residents during OH while they are on call AH. 6 PG residents per shift. Daytime 6 consultants are available. After 5 pm, 2 consultants on the telephonic call. They call others to ED after stabilizing patients Residents have 8 h shift duties with equal distribution. Since all four hospitals are large public university hospitals, the trauma services are supported by other disciplines as and when needed especially by neurosurgeons, orthopedics, anesthesia, radiological and lab services round the clock.

2.2. Participants

The registry includes patients with potentially life-threatening injuries and excludes patients who were dead on arrival. For our analysis, we included patients of all ages if they had an injury and were admitted to the hospital. "Office-hours" (OH) were defined as 9 am to 5 pm, Monday to Friday, and 9 am to 1 pm on Saturdays and "After-hours" (AH) were defined as 5:01 pm till 8: 59 am Monday to Saturday and 1:01 pm Saturday to 8:59 am Monday. These definitions and time periods were selected after examining the standard staffing practices of participating sites. All four participating hospitals had higher ratios of staff (consultant physicians, nurses, and paramedical health care professionals) during "office -hours" compared to "After-hours". There was an approximately 90% reduction of consultant physician presence during "After-hours" whereas resident physician staff were reduced by approximately 50%. The nursing presence was marginally decreased (10 to 20%).

2.3. Data sources

The AITSC registry was established as part of the AITSC collaboration. It collected prospective information on major trauma patients from four trauma centres within three cities in India. At each of the centres, two data collectors were posted in the Emergency Department (ED) or Casualty area. During "Office-hours", data was collected by data collectors through direct observation of healthcare staff and patients. "After-hours" data was collected through medical record abstraction at a later date. Information was recorded as per the AITSC Trauma Registry Data Dictionary (Versions 1:04, January 2018)under the supervision of the trauma project managers. At each study site, the trained data collectors coded injuries using the Abbreviated Injury Scale (AIS) (2005, updated 2008). Data was collected on paper forms then inputted onto a Microsoft Excel form, which was uploaded onto a dedicated server located at JPNATC via a Secure File Transfer Protocol (SFTP). The uploaded data did not include any patient identifiers.

Data collectors reviewed and cross-checked inconsistencies with the paper record. Additional data cleaning was performed by a qualified biostatistician at the principal lead site in Australia – the National Trauma Research Institute (NTRI) in Australia, part of Alfred Health and Monash University. All data were stored on limited access, password-protected server, backed up at three sites. Individual site data was viewable by site staff and investigators via a secure login for that site. Aggregate data was only accessible to the principal leads site – JPNATC and the NTRI. The aggregate data remains the property of the AITSC and is managed by the AITSC Registry Steering Committee. Participating hospitals were coded in a non-identifiable format for this study.

2.4. Variables

We obtained data elements relevant to the current investigation in the AITSC registry. These were: age; gender; type of injury; mechanism of injuries; first vitals recorded on arrival (systolic blood pressure (SBP), heart rate (HR), respiratory rate (RR) peripheral capillary oxygen saturation (SpO2); Glasgow Coma Scores (GCS); injury severity score (ISS) and revised trauma score (RTS). The injury scores were calculated from measured variables using the standard methods. We also obtained data representing the process of care within the first 48 h of arrival. These were: Time to first vitals; time to ED disposition; time to X-ray chest; time from first vitals to CT scan, and time from first vitals to Operating room(OR). For "Time to first vitals" and "Time to ED disposition", time was measured from the arrival of the patient. Time to ED disposition was defined as the duration of stay in the ED.

2.5. Endpoints

The primary endpoint was in-hospital mortality, defined as death occurring during the hospital stay. Secondary endpoints were early mortality-defined as deaths occurring within 24 h, duration of mechanical ventilation, length of ICU and hospital stays- defined in the AITSC Trauma Registry Data Dictionary as the total number of days a patient was admitted to the ICU and admitted in the hospital, respectively. Only the first admission to the hospital was considered.

2.6. Statistical analysis

Variables were summarized with mean and standard deviation or median and interquartile range, depending on the distribution of the data. The primary endpoint (in-hospital mortality) and secondary endpoints (duration of mechanical ventilation, length of ICU stay, hospital stay, and early mortality) were analyzed using the chi-square test and student's *t*-test depending on the presence of categorical or continuous variables. Non-parametric tests(Mann Whitney) were used wherever the assumption of normality or equality of variance was violated, specifically to compare the length of ICU stay, duration of mechanical ventilation, and hospital stay. Multivariable regression models were used to estimate the association between grouping variables ("Office-hours" and "After-hours") and in-hospital mortality adjusting for severity, the presence of shock on arrival, referral status, sex or the extremes of age. In addition, to identify the interaction of hypothesized primary association with the above factors, we performed individual multivariable logistic regression models that included the grouping variable, aforementioned factor, and an interaction term to isolate the subgroup effect [16]. R Project for Statistical Computing, version 3.6.1, was used for statistical analysis.

2.7. Sample size calculation

Since this is a retrospective analysis of an existing registry, we included all patients fulfilling the inclusion criteria. The estimated sample size assumed that in hospital mortality would be 16% during "After-hours" and 13% during "office- hours" based on previously reported literature.(13)This provided us with a sample size of 5786 for 90% power with 5% alpha error.

2.8. Ethics clearances

Ethics approval for these studies (including the intervention) was granted by each hospital's human research ethics committee site AIIMS (IEC/NP-327/2013); LTMG-IEC/83/14; VS-approved 13/11/2013; GTB-approved 12/2/2015) and individual trauma patient on-admission consent process was waived for observational data. In Australia, the AITSC program of work was approved by the Alfred Hospital Ethics Committee (Project 245/17), the Monash University Human Research Ethics Committee (CF16/1814–2,016,000,929).

3. Results

AITSC registry incorporates details of 9354 trauma patients, out of which 1257 were excluded from the current study because of missing arrival time information and outcomes. 8097 patients fulfilled the inclusion criteria and were included in the analysisFig. 1). Of this cohort, 969 (12%) patients died during the hospital stay while 7128 (88%) patients survived to hospital discharge. 2561 (31.6%) arrived at participating sites during "Office-hours" and 5536 (68.4%) arrived "After-hours".

The distribution of baseline characteristics within the entire cohort and between the groups is shown in Table 1. The majority of patients in the study were men (82%) and the average age of the study cohort was 32 years. Road traffic injury(RTI) was the most common mechanism of injury (48.2%) followed by falls (30.9%), and assault (8.4%). Over 90% of injuries were from blunt mechanisms. The median ISS of the cohort was 9 [10] and mean RTS was 7.4 [1] . The distribution of these variables between OH and AH groups was relatively similar though traumatic brain injury was more common in patients who presented during AH(16%) compared to OH(13.3%) (Table 1)

The process of care variables differed between the OH and AH groups. The OH group had lower time to first vitals and ED disposition but the time from first vitals to imaging (X-ray, Chest, CT Scan) and the operative room was prolonged compared to the AH group. Table 2

3.1. Study end points

In-hospital mortality, the primary end-point, was 11.6% in the OH group versus 12.1% in the AH group, a risk ratio of 0.96 for OH patients compared to AH patients but this difference is not statistically significant (95%, CI, 0.84 to 1.1, p value 0.48) Table 3. We did not observe an association between arrival time and in-hospital mortality (OR 1.02, 95%CI,0.87–1.2) in multivariable regression analysis after adjusting for sex, the presence of shock, the extremes of age, the severity of injury and referral status.(Table 4).

Multiple additional analyses, to identify the interaction of arrival time and in-hospital mortality with the above variables failed to identify a relationship within any subgroup except traumatic brain injury(TBI). Compared to AH, arrival in OH with a severe head injury was associated with reduced odds of death (Odds ratio 0.65). The same was not seen with a moderate head injury.

ICU length of stay and duration of mechanical ventilation was longer in the AH group. There was no statistically significant difference in a total hospital stay or early mortality Table 3(between the groups.

4. Discussion

In this multicenter study spanning four tertiary trauma hospitals in an LMIC, we found that all cause in-hospital mortality does not significantly differ between trauma patients that arrive during "office-hours" (OH) and "after-hours" (AH) (11.6% vs. 12.1%, $p = 0.48$). When we assessed the relationship adjusting for gender, presence of shock, extremes of age, the severity of illness, and referral status through a multivariable regression model, we still found no significant association between arrival time and in-hospital mortality. The lack of association was true between the time of arrival and an analysis of early mortality. This further reinforces the robustness of these findings.

We had hypothesized that trauma patients arriving during AH would experience higher mortality as there are lesser health care personnel (doctors and support staff) and a higher number of trauma admissions, with increased severity, at night. A study from the Royal Perth Hospital in Australia, for example, reported a higher incidence of missed injuries in patients presenting AH than during OH [17]. This hypothesis was also supported by a previous single centre investigation by our group which had found significant differences in in-hospital mortality during OH versus AH (13.0% and 16.10%). This study had included participants from a different database and time period and, notably,

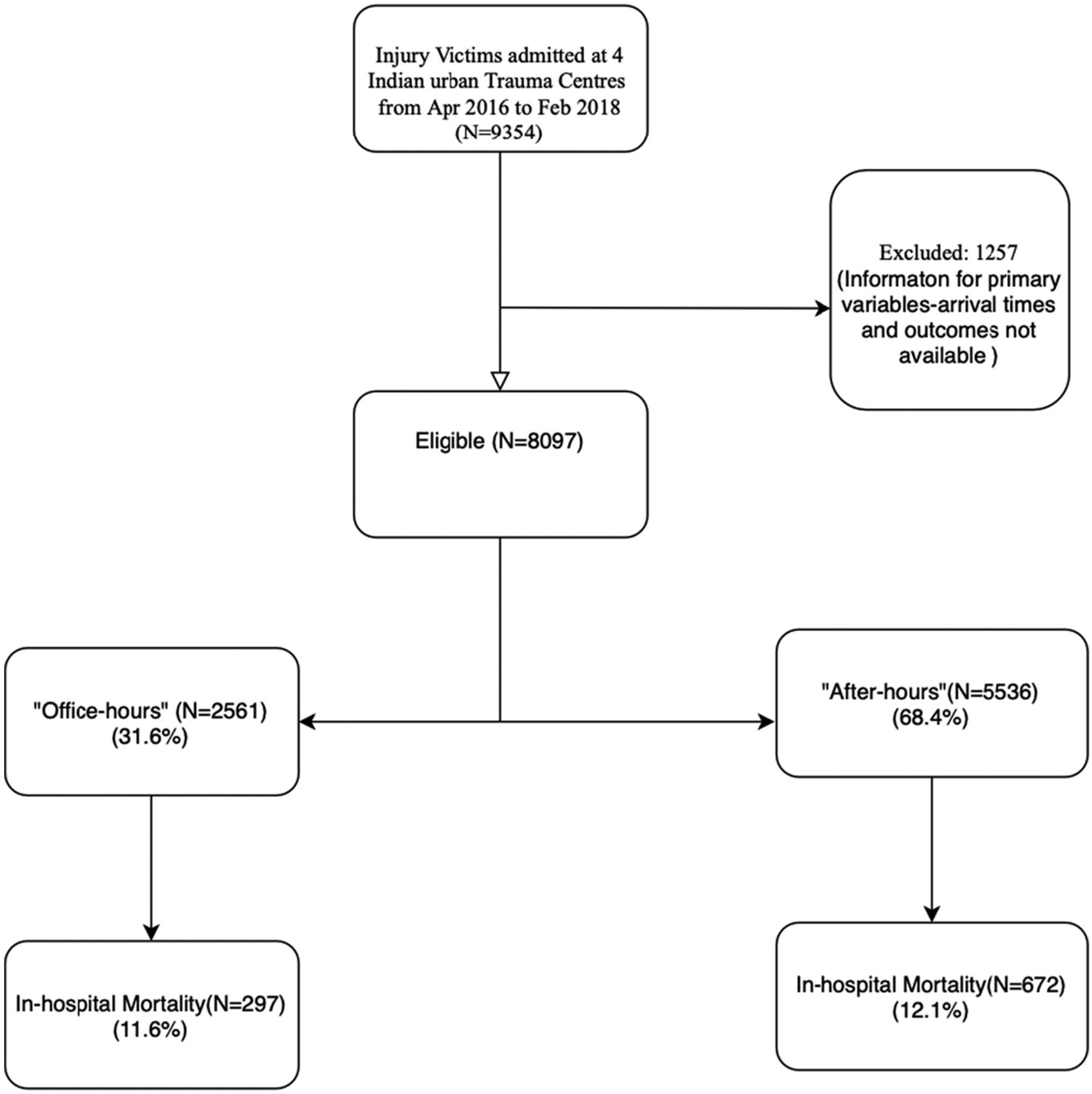

Fig. 1. Recruitment algorithm for trauma patients arriving during "Office-hours" and "After-hours".

the overall mortality in that registry was higher compared to our current study (14.9% versus 12%) [13]. Despite low overall mortality, our study was well powered to detect the clinically important differences for in-hospital mortality.

The absence of a significant relationship in our study may suggest that trauma patients in urban Indian trauma centres may receive consistent quality trauma care independent of timing. This is similar to the literature originating from HICs, Hirose et al. used from a nationwide registry in Japan that included 170,622 patients and demonstrated a statistically significant but clinically meaningless distinction between in-hospital mortality in OH and AH admissions (7.57% OH versus 7.70% AH) [18]. Likewise, Parch et al. reported no difference in the outcomes between the two groups in severely injured patients presenting to a German level-1 trauma centre. (5)Similarly, Brinck et al. also found no significant association between arrival time and mortality in severe blunt trauma patients admitted to a single tertiary centre at Helsinki, Finland [12].

Another potential explanation for the lack of association between arrival time and mortality may rest in the results for the process-of-care variables. Both time to first vitals and time to ED disposition were lower in the OH group but the time to obtain imaging (X-ray and CT) or go to the operating room were considerably lower during AH. Prior studies in high-volume trauma centers have shown that delays to the operating room due to imaging or otherwise are independent predictors of mortality [19]. This perhaps underscores the complex interplay of many factors, both human and logistics, that impact different care processes in hospitals, differently. Perhaps the additional nursing and physician workforce during the day expedites direct patient care but imaging and operative availability are limited due to competition with elective patients and the usual daily workload. These subtle differences play a role in why AH patients do not have worse mortality compared to those who arrive during OH.

Notably, our results failed to show a consistent relationship between arrival time cohorts and the secondary outcomes: duration of mechanical ventilation, length of ICU, or hospital. Though the duration of mechanical ventilation and length of ICU stay was the longer, the length of hospital stay was shorter in the AH cohort. The mechanism behind the inconsistent relationship between arrival time cohort and secondary outcomes could be because of other factors such as available resources, expertise, and especially hospital policies for discharge which could vary between centers and time.

Table 1
Baseline characteristics of patients arriving in "After-hours" and "Office-hours".

Characteristics	"Office-hours" ($n = 2561$)		"After-hours" ($n = 5536$)		Cohort ($n = 8097$)	
Demographics	Value	N	Value	N	Value	N
Age-yr, mean(SD)		2558		5533		8091
	33.5(19.8)		31.1(17.4)		31.8(18.2)	
Sex-Male, no.(%)	2020(78.9)	2561	4616(83.4)	5536	6636 (81.9%)	8097
Mech of Injury		2561		5534		8095
Assault no. (%)	171(6.7)		511(9.2)		682 (8.4)	
Falls	930(36.3)		1575(28.5)		2505(30.9)	
RTI	1168(45.6)		2736(49.4)		3904(48.2)	
Railway	112(4.3)		235(4.3)		347(4.2)	
gunshot	20(0.8)		73(1.3)		93(1.1)	
others	160(6.3)		404(7.3)		564(7.0)	
Dominant Injury,		2558		5527		8085
Blunt no.(%)	2409(94.1)		5085(92.0)		7494(92.7)	
Penetrating	127(5.0)		424(7.7)		551(6.8)	
Other	22(0.9)		18(0.3)		40(0.5)	
SBP (mmHg), mean,(SD)		2379		5182		7561
	120.7(17.4)		118.8(18.7)		119.4(18.3)	
HR-beats/min		2520		5438		7958
mean,(SD)	91.5(17.5)		93.2(18.6)		92.6(18.3)	
RR-breaths/min		2316		4828		7144
mean,(SD)	19.3(3.6)		19.2(3.9)		19.3(3.8)	
SpO2-% saturation		2303		4690		6993
mean,(SD)	97.5(5.9)		98.5(4.8)		98.2(5.2)	
GCS,median,(IQR)	15(1)	2516	15(3)	5400	15(2)	7916
GCS		2516		5400		7916
Mild	1974(78.5)		4041(74.8)		6015(76)	
Moderate	200(7.9)		472(8.7)		672(8.5)	
Severe	342(13.6)		887(16.4)		1229(15.5)	
ISS, median(IQR)		2540		5476		8016
	9 (9)		9 (10)		9(10)	
ISS		2474		5340		7814
Mild	836(33.8)		1799(33.7)		2635(33.7)	
Moderate	1074(43.4)		2241(42)		3315(42.4)	
Profund	108(4.4)		300(5.6)		408(5.2)	
Severe	456(18.4)		1000(18.7)		1456(18.6)	
RTS, mean,(SD)		2176		4526		6702
	7.4 ± 1.0		7.3 ± 1.0		7.4 ± 1.0	

"Office-hours" - Monday to Friday 9 am to 5 pm and Saturday 9 am to 1 pm.
"After-hours" - Monday to Friday 5:01 pm to 8:59 am and Saturday 1:01 pm to 8:59 am Monday.

Table 2
Process of care characteristics[*]

	Cohort	"Office-hours"	"After-hours"	*p* Values
Time to first vitals(*hrs*)[a]	0.2(0.4)	0.1(0.2)	0.2(0.49)	0.024
Time to ED disposition(*hrs*)[a]	5.0(7.3)	3.1(6.8)	5.5(7.4)	<0.001
Time from first Vitals to Xray chest (hrs)	1.1(3.1)	1.5(3.5)	0.5(2.8)	<0.001
Time from first vitals to CT scan (hrs)	1.4(2.6)	2.2(3.9)	1.3(1.9)	<0.001
Time from first vitals to OR (hrs)	6.2(12.7)	9.1(16.1)	5.5(11.1)	<0.001

[*] The values are summarized by median (IQR)and represent observations within 48 h of arrival.
[a] Time measured from arrival of the patient.

Table 3
Primary and secondary outcomes in "office- hours" and "After-hours" groups.

	Cohort	N	"office- hours"	N	"after- hours"	N	*p*-value
Death, no.(%)	969(12)	8097	297(11.6)	2561	672(12.1)	5536	0.48
Duration of mechanical ventilation,days,mean,(SD)	1.6(4.6)	8048	1.5(4.6)	2543	1.6(4.7)	5505	0.004[b]
Length of ICU stay,days, mean,(SD)	2.3(5.3)	8068	2.2(5.5)	2550	2.3(5.2)	5518	0.04[b]
Length of hospital stay,days, mean,(SD)	10.2(14.9)	7970	10.4(16.2)	2522	10.1(14.3)	5448	0.74[b]
Early mortality no.(%)[a]	281(28.2)	997	92(31.6)	291	189(26.8)	706	0.12

[a] Early mortality defined as deaths occurring within 24 h of arrival.
[b] Mann-Whitney test was used for significance testing.

Table 4
Multivariable logistic regression analysis for In-hospital Mortality *.

	Estimate	Standard Error	Odds Ratio	p Value	95%CI
(Intercept)	2.077	0.110	7.984	< 0.001	6.430 - 9.913
Arrival group[a]	0.023	0.083	1.023	0.781	0.870 - 1.203
Gender[b]	0.103	0.101	1.109	0.309	0.909 - 1.352
Presence of Shock[c]	−1.693	0.126	0.184	< 0.001	0.144 - 0.236
Extremes of Age[d]	0.127	0.095	1.136	0.181	0.943 - 1.368
Severity of Illness(*ISS*)[e]	−0.722	0.079	0.486	< 0.001	0.416 - 0.567
Referral status[f]	0.386	0.077	1.471	< 0.001	1.266 - 1.710

*The reference category for outcome variable "In-hospital mortality" is death. Reference categories for other variables are: [a] "After-hours"; [b] "Female"; [c] "No shock"; [d] "Not extreme age"; [e] "Non severe ISS"; [f] "Referred"; [d]Extremes of age is defined as age < 18 or > 60 years.

Strength and limitations:

Our study is a multicentre cohort from four large public hospitals of India. Though the infrastructure and referral settings are representative of other urban large public hospitals in India, it is uncertain whether the results could be generalized to other tertiary level public sector hospitals of the country providing essential trauma services. This is attributed to the large variation prevalent in the resources and trained personnel within the country. The trauma registry provides a large study population with uniformity of data elements, systematically collected data, and low missing values. The current study retains the power to identify clinically significant differences between the two-cohort population thus reducing type 2 error. Despite multicentre data, it could mask the intra-hospital variations. Centres may vary significantly to each other in terms of both practice patterns and strength of health care providers during "Office-hours" and "After-hours". This may lead to a type 1 error in overall estimates of the difference in in-hospital mortality. We have not presented the data of individual sites as that would identify individual centres. However, we did study the impact of hospital level factors on the association of arrival timing and outcomes using generalized linear mixed model, we found hospital level factors did not impact the association between arrival timings and outcomes. Other limitations include the process of data collection within the trauma registry. "Office-hours" data elements were mostly directly observed whilst "After-hours" were retrospectively abstracted from the medical records. This could bias the estimates for the difference in baseline severity of illness, and vital parameters in groups towards the null. Nonetheless, this would not affect the outcome endpoints as they were objective (In-hospital mortality and other secondary endpoints). Also, The mean SBP and HR seem to point to less severe injuries and the low mortality outcomes may render it difficult to detect a statistically significant difference between the two. Although we had examined hospital mortality as our primary outcome, we could not gather information about the causes of deaths, as it was not available in the trauma registry. Analyzing causes of deaths after major trauma could have highlighted whether they were preventable or not and their distribution during "Office-hours" and '"After-hours". Though the feasibility and accuracy of information are often debatable from low resource settings as this would require information from autopsies and considerable resources given the numbers of patients, yet future trauma registries should seek this specific information. In-hospital mortality was selected as a primary endpoint since the registry had in hospital mortality event. No further follow up was available once the patients were discharged. Though the current study does not show differences in mortality between OH and AH, the optimum ratio, as well as the adequacy of specialists, residents, and nursing for the care of patients in both groups, cannot be determined via present study and the study may be negative due to presence of unmeasured confounders such as the absence of information regarding treatment, complications, and level of training of care providers. Also, it can not be assumed that the quality of care is similar to HIC. The present study does not compare quality of care between the study centres and other high income resource countries.

5. Conclusion

The arrival time of major trauma patients during the "Office-hours" and '"After-hours" in four Indian university hospitals did not affect overall in-hospital mortality significantly, nor the morbidity measured by the duration of ICU and In-hospital stay.

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Funding

Mentioned below the conclusion

Declaration of Competing Interest

The authors have declared that no competing interests exist

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