

Demographic and clinical profile of brought in dead cases to pediatric emergency department of a tertiary care hospital

Ratan Gupta¹, Priyanka Tiwari², Manas Pratim Roy³, Sumaira Khalil⁴, Archana Kashyap⁵

From ¹Associate Professor, ²Senior Resident, ⁴Specialist, ⁵Assistant Professor, Department of Pediatrics, Safdarjung Hospital, ³Deputy Assistant Director General, Ministry of Health and Family Welfare, New Delhi, India

Correspondence to: Dr. Priyanka Tiwari, Flat no A 73, Rail Nagar, Sector 50, Noida - 201 301, Uttar Pradesh, India.

E-mail: tiwaripriyanka553@gmail.com

Received - 12 March 2019

Initial Review - 25 March 2019

Accepted - 09 May 2019

ABSTRACT

Background: The incidence of brought in dead (BID) is high in tertiary hospitals, but there is a lack of proper audit and relevant data of these cases. **Objective:** The current study aimed to assess the demographic characteristics and clinical profile of BID patients presenting in emergency department (ED) of a tertiary hospital. **Materials and Methods:** This was a retrospective observational study. All children between 0 and 12 years who were BID at the pediatric ED in a tertiary hospital between February 2018 and December 2018 were included. Data were collected on demography, history of illness, treatment seeking history, and details about transport to the hospital. Microsoft Excel was used for analysis. **Results:** A total of 64 BID cases were included in the study, of which 39% cases belonged to the neonatal age group. Most of the referrals were from government hospitals. Of total neonatal deaths, 44% were preterm babies; 52% of neonates had a previous history of hospitalization. Among previously hospitalized cases, 56% were discharged and 22% took their child against medical advices. **Conclusion:** It is crucial that the government reinforces the measures to avoid the existence of clandestine health centers. Improving referral-counter-referral system will permit the limitation of fatal medical errors. This study expects to bring the focus on BID so that future studies explore the possible strategies to contain this problem.

Key words: Brought in dead, Emergency department, Neonates, Referral

Brought in dead (BID) is a term used to indicate that a patient was found to be already clinically dead upon the arrival of professional medical assistance, often in the form of the first responders such as emergency medical technicians, paramedics, or police. The literature lacks a consensus-based definition of deaths before reaching a facility [1,2]. Nevertheless, the broad definition of BID may include patients who were either declared BID to an emergency department (ED) with no resuscitation attempt or those who died after failed resuscitation, usually within the first 60 min of arrival [2-4].

The prevalence of BID is usually <1-2 per 100 ED visits in settings with well-established, resourceful emergency care systems [2,5]. In resource-poor settings, the prevalence of BID is expected to be higher, but few studies are available about the burden and characteristics of BID patients in these settings [6,7]. There is a paucity of data in literature as far as India is concerned.

The burden of these deaths is disproportionately high in low- and middle-income countries (LMICs) [1,8,9] and is explained by the pervasive health risks and under-resourced health-care systems [10]. More often than not, the causes of preventable deaths are neglected in LMICs, especially if they occurred before reaching or just after arriving at a health facility [2,3,11]. Care at the prehospital and ED levels plays a

pivotal role in reducing deaths, especially BID from injuries and critical illnesses [6,10,12,13]. In our country, a suboptimal referral system, as well as an infrastructure, also enhances the problem to some extent. In this perspective, our study aimed to assess the characteristics (demographic and clinical profile) of BID patients presenting in the ED of a tertiary hospital.

MATERIALS AND METHODS

The current study was a retrospective study for which ethical committee approval was waived. Permission was obtained from competent authority. All children between 0 and 12 years of age BID at the pediatric emergency in a tertiary hospital of New Delhi between February 2018 and December 2018 were considered. The cases with a history of physical trauma, medicolegal cases, and accidents were excluded from the study. Any patient who was either declared BID to an ED with no resuscitation attempt or those who died after failed resuscitation within the first 60 min of arrival were defined as BID cases. After receiving such patients in the emergency room by doctor on duty, resuscitation was carried out according to the protocol, and death was ascertained clinically. No palpable carotid pulse, bilateral dilated, and fixed pupils; no heart sound heard for 2 min count; no breathing sound observed

for 2 min; no response to centralized stimulus; and no motor (withdrawal) response or facial grimace in response to painful stimulus and flat line on electrocardiography together were taken as evidence of death. Data were collected on demography, history of illness, treatment seeking history, and details about transport to hospital. Data entry was done in Microsoft Excel and analysis was done. For categorical variables, percentage and frequency were calculated.

RESULTS

There were 64 BID patients recorded and analyzed during the study period. The males accounted for 44% of total BID cases and females accounted for 56% of total BID cases, and male-to-female (M: F) ratio was 0.77 (Table 1). A maximum number of BID cases belonged to 0–28 days of the age group that accounted for 39% of total cases with male predominance (M: F in this age group was 1.5:1) followed by 33% of cases in infancy age group (M: F=0.75:1). Total 19% of cases belonged to >1 year–5 years of age and only 9% of cases belonged to >5 years of age group (Table 1).

Table 1 also depicts the percentage of BID cases that were either referred from the hospital or brought directly from home. A total of 41% cases were hospital referrals out of which most (65%, 17 out of total of 26 hospital referrals) were referred from Government Hospital providing a secondary level of care. More than half of the cases, i.e., 38 (59%) were BID from home. It also depicts the pre-existing illness related to the organ system that BID cases were suffering from. A broad category belonged to others group (37 cases, 58%) that could not be fitted into any specific organ system and included miscellaneous cases such as birth asphyxia, sepsis, syndromic cases, aspiration cases, and snake bite. Rest of the 15% cases had pre-existing gastrointestinal illness followed by respiratory (11%) then central nervous system (8%) followed by cardiovascular system (5%) and finally hematological cases (3%).

Table 2 highlights some important details with respect to neonatal deaths that were BID. Out of 25 neonatal deaths, 44% were preterm babies. Total 76% deliveries took place in the hospital and home deliveries accounted for only 24% of cases. Out of total study population, 13 (52%) patients had previous history of hospitalization due to some or other reasons and 56% of total neonatal BID cases were referred from hospital. Total 18 such cases were there, with previous history of hospitalization, out of which 56% were discharged and 22% cases left against medical advice (LAMA), as per their respective parent's decision. 11% cases were discharged on parents request (DOPR) and other 11% cases were being followed from the outpatient department (OPD).

DISCUSSION

This retrospective observational study described the burden and characteristics of BID patients brought in ED of a tertiary hospital.

Table 1: Comprehensive table to depict various characteristics of the study population

Characteristics	Number n (%)
Sex	
Male	28 (44)
Female	36 (56)
Age group	
0–28 days	25 (39)
28 days–1 year	21 (33)
>1 year–5 years	12 (19)
>5 years	6 (9)
Referral details of the study population	
Government hospital – secondary level	17 (27)
Private hospital	9 (14)
Home	38 (59)
Pre-existing illness in relation to organ system	
Respiratory	7 (11)
CVS	3 (5)
CNS	5 (8)
GIT	10 (15)
Hematological	2 (3)
Others	37 (58)
Outcome trends in those brought dead cases with previous history of hospitalization	
Discharge	10 (56)
LAMA	4 (22)
DOPR	2 (11)
Follow up from OPD	2 (11)

CVS: Cardiovascular system, CNS: Central nervous system, GIT: Gastrointestinal tract, LAMA: Left against medical advice, DOPR: Discharged on parents request, OPD: Outpatient department

Table 2: Characteristics of neonatal BID cases (n=25)

Neonatal characteristics	Total n (%)
Duration of pregnancy	
Term	14 (56)
Preterm	11 (44)
Place of delivery	
Home	6 (24)
Hospital	19 (76)
Previous history of hospitalization	13 (52)
Referred from other hospitals	14 (56)

BID: Brought in dead

International statistics on BID cases burden in EDs in resource-limited settings are mostly unavailable, and this study provides useful insights about the burden of BID patients in tertiary care hospital of developing nation [2–4,14,15]. In a city with multiple options for getting treatment, it is agonizing that so many children are brought dead in a single tertiary hospital. As no national figure is available, the data could not be compared with other cities or hospitals.

A total of 64 cases were recruited for the study. Neonatal mortality constituted 39% of total BID cases and approximately

54.3% of infant mortality. As the first 48 h after birth is crucial for child survival, the health-care systems must stress the mother and infant to stay in the hospital after the delivery. Ensuring minimum stay would be helpful in timely medical intervention, if needed.

Another study from Zimbabwe found highest death rate among infants, a finding similar to the current study [16]. There was female preponderance beyond the neonatal age group, but among neonates, there was male dominance. This gender ratio is in sharp contrast to the previous findings. BID cases were referred from hospital settings (government or private), which indicate the need for a close introspection at various levels including condition of the baby at the time of referral, referral policy, and transport mechanisms available/used.

The underlying reason for deaths among cases coming from hospitals could not be ascertained from the available data. This could be due to improper stabilization of the baby before transfer or due to inadequate availability of proper resuscitation measures during the referral or simply lack of efficient and trained medical personnel accompanying during the transport.

About 59.4% cases were BID directly from home. This could be due to lack of realization about the seriousness of the pre-existing illness that the child might be suffering from by the parents. Lack of access to the appropriate medical facility near to their homes could also be a possible reason accounting for the same.

Impact of diseases is underestimated as far as developing countries are concerned, and the same is reflected in statistics from various hospitals [17]. Very few patients report to health facility as the first intention while seeking treatment [18], and therefore, the patient and family members end up at places delivering informal health services [19]. This includes traditional healers, nurses, and doctors working in private setups, with their services being dictated by cost, distance, lack of proper communication between health-care professional and patient, and without any proper protocol being followed at the time of institution of treatment [20].

In India, previous research documented that about 5% children seek help from traditional healers [21]. Around 76% of neonatal deaths in our study were hospital born. The government is repeatedly stressing on ensuring minimum hospital stay after delivery to ensure better health of the newborn. Future research should explore the role of such intervention in reducing the need of hospital admission and frequency of BID. Total 18 cases had previous history of hospitalization including all the age groups which were either discharged, or took DOPR, or LAMA or were followed up from OPD and were BID when received in ED of the study hospital. Furthermore, studies have shown that errors in pediatric prescriptions are frequent even in authorized health-care facilities [22]. With respect to term versus preterm pregnancy, no significant statistical difference was found.

Economic, sociocultural factors, and inadequate maternal services were documented earlier as cause of delayed arrival to hospital in one of the studies [23] Thus, social factors play a significant role in these deaths. Some Nigerian studies also found out among other causes that the poverty state of most patients, late presentation at the point of care, ignorance, and the interference

by untrained persons claiming to give medical care often lead to most avoidable death at the ED [24].

At different levels of health pyramid, communication between the health-care professionals and patients is poor [25]. Lack of proper functioning or poor functioning of the referral/counter-referral system in our setting is also responsible for non-continuity of health care. As a result of this, families resort to others services before deciding to bring their children to the hospital. Such children are 6 times more likely to be re-admitted in the hospital [26]. Switching to a different health structure with respect to former is found to be associated with increased risk of death in the month following the previous hospital admission [27]. In these conditions, medical errors will be equally common.

In developing nations and resource-limited countries, the same situation will have exponentially hazardous results [22]. The probability of death of children after hospitalization (1–18%) is greater than that during hospitalization [28]. Many die in the community [29] or before arrival in the hospital. Delay, either in recognizing danger signs of the disease or visiting the nearest health facility, could be the possible causes [30]. It is for this reason that some children arrive at the emergency services already dead during course of their transportation to the hospital. Given the emotional state of the family members after the death, it is not usually possible to precise the circumstances of death.

The practice of all components of the integrated management of childhood illness is therefore a necessity. This ensures the reinforcement of capacities of personnel and the community health workers to work in close proximity to families so as to permit early and prompt management of sick children [31]. Such measures will help mothers or caretaker to better recognize danger signs in neonates and children and thus seek appropriate health care [32,33]. Parents, however, prefer private sectors over public health-care facilities as observed in our context [33]. Nearly 3% of children have had at least 4 hospitalizations per year, as seen in some studies [34] and this is associated with increased probability of death [28]. Rehospitalization is associated with increased frequency of deaths, especially when there is a lack of communication between the doctors at different levels, during referral or during discharge [25].

Health facilities offer opportunities, where parents are advised develop an attitude to adopt, depending on the evolution of their children's disease. Many researchers think that communication will permit avoiding errors during drug prescription [35]. As most of the deaths from the present study were in neonatal period, there is need for being extra cautious. This period is very much vulnerable, as highlighted in other studies on pediatric mortality [36]. Strengthening of hospital may be necessary, but awareness on danger signs of the infants is predominant, as perceived from the fact that 60% cases in ED directly came from home.

CONCLUSION

BID not only indicates the ignorance and inability of parents in perceiving the gravity of the underlying illness and recognition of

danger signs but it also shows the failure of our health-care system. It is more of a public health problem, and there is a necessity for a multicentric prospective study for knowing the social causes, economical status, health-seeking behavior of family members, and appropriate cause and level of delay in seeking medical help, as factors responsible for BID. It must include the provision of interview by parents so as to find the exact cause of death at the point of receiving the patient BID in ED of any tertiary hospital.

REFERENCES

- Roudsari BS, Nathens AB, Arreola-Risa C, Cameron P, Civil I, Grigoriou G, *et al.* Emergency medical service (EMS) systems in developed and developing countries. *Injury* 2007;38:1001-13.
- Calland JF, Nathens AB, Young JS, Neal ML, Goble S, Abelson J, *et al.* The effect of dead-on-arrival and emergency department death classification on risk-adjusted performance in the American college of surgeons trauma quality improvement program. *J Trauma Acute Care Surg* 2012;73:1086-91.
- Pasquale MD, Rhodes M, Cipolle MD, Hanley T, Wasser T. Defining dead on arrival: Impact on a level I trauma center. *J Trauma* 1996;41:726-30.
- Lockey AS. Recognition of death and termination of cardiac resuscitation attempts by UK ambulance personnel. *Emerg Med J* 2002;19:345-7.
- Wang JS, Cheng SH, Leu LJ, Hsu PI, Ker CG, Huang YC, *et al.* Dead on arrival study in Kaohsiung area. *Gaoxiong Yi Xue Ke Xue Za Zhi* 1995;11:21-6.
- Kobusingye OC, Hyder AA, Bishai D, Hicks ER, Mock C, Joshipura M, *et al.* Emergency medical systems in low- and middle-income countries: Recommendations for action. *Bull World Health Organ* 2005;83:626-31.
- Khan NU, Razzak JA, Alam SM, Ahmad H. Emergency department deaths despite active management: Experience from a tertiary care centre in a low-income country. *Emerg Med Australas* 2007;19:213-7.
- Vioque SM, Kim PK, McMaster J, Gallagher J, Allen SR, Holena DN, *et al.* Classifying errors in preventable and potentially preventable trauma deaths: A 9-year review using the joint commission's standardized methodology. *Am J Surg* 2014;208:187-94.
- Afuwape OO, Okolo CA, Akinyemi OA. Preventable trauma deaths in Ibadan: A comparison of revised trauma score and panel review. *West Afr J Med* 2011;30:19-23.
- Kobusingye OC, Hyder AA, Bishai D, Joshipura M, Hicks ER, Mock C. In: Jamison DT, Breman JG, Measham AR, Alleyne G, Claeson M, Evans DB, editors. *Disease Control Priorities in Developing Countries*. Vol. 2. Washington, DC: World Bank; 2006.
- Motomura T, Mashiko K, Matsumoto H, Motomura A, Iwase H, Oda S, *et al.* Preventable trauma deaths after traffic accidents in Chiba prefecture, Japan, 2011: Problems and solutions. *J Nippon Med Sch* 2014;81:320-7.
- Arreola-Risa C, Mock CN, Lojero-Wheatly L, de la Cruz O, Garcia C, Canavati-Ayub F, *et al.* Low-cost improvements in prehospital trauma care in a Latin American city. *J Trauma* 2000;48:119-24.
- Arreola-Risa C, Mock C, Herrera-Escamilla AJ, Contreras I, Vargas J. Cost-effectiveness and benefit of alternatives to improve training for prehospital trauma care in Mexico. *Prehosp Disaster Med* 2004;19:318-25.
- Chiang TC, Wang CY. Dead-on-arrival patients in Panchiao, Taipei. *Zhonghua Yi Xue Za Zhi (Taipei)* 1999;62:509-13.
- Danner OK, Wilson KL, Heron S, Ahmed Y, Walker TM, Houry D, *et al.* Benefit of a tiered-trauma activation system to triage dead-on-arrival patients. *West J Emerg Med* 2012;13:225-9.
- Wolf BH, Ikeogu MO. Deaths at home and in hospital in Zimbabwe. *Arch Dis Child* 1992;67:600-2.
- World Health Organization. *Statistiques Sanitaires Mondiales*. Geneva: World Health Organization; 2009.
- Commeyras C, Ndo JR, Merabet O, Kone H, Rakotondrabe FP. Household behaviour regarding health and drug consumption in Cameroon. *Sante* 2006;16:5-12.
- Burton DC, Flannery B, Onyango B, Larson C, Alaii J, Zhang X, *et al.* Healthcare-seeking behaviour for common infectious disease-related illnesses in Rural Kenya: A community-based house-to-house survey. *J Health Popul Nutr* 2011;29:61-70.
- Tizio S, Flori YA. The Bamako initiative : health for all or illness for everyone? *Tiers-Monde* 1997;38:837-58.
- Kalita D, Borah M, Kakati R, Borah H. Primary caregivers health seeking behaviour for under-five children: A study in a rural block of Assam, India. *Natl J Commun Med* 2016;7:868-72.
- Walsh KE, Landrigan CP, Adams WG, Vinci RJ, Chessare JB, Cooper MR, *et al.* Effect of computer order entry on prevention of serious medication errors in hospitalized children. *Pediatrics* 2008;121:e421-7.
- Jafarey SN, Korejo R. Social and cultural factors leading to mothers being brought dead to hospital. *Int J Gynaecol Obstet* 1995;50 Suppl 2:S97-S99.
- Adesunkanmi AR, Akinkuolie AA, Badru OS. A five year analysis of death in accident and emergency room of a semi-urban hospital. *West Afr J Med* 2002;21:99-104.
- Kripalani S, LeFevre F, Phillips CO, Williams MV, Basaviah P, Baker DW, *et al.* Deficits in communication and information transfer between hospital-based and primary care physicians: Implications for patient safety and continuity of care. *JAMA* 2007;297:831-41.
- Moore C, Wisnivesky J, Williams S, McGinn T. Medical errors related to discontinuity of care from an inpatient to an outpatient setting. *J Gen Intern Med* 2003;18:646-51.
- Staples JA, Thiruchelvam D, Redelmeier DA. Site of hospital readmission and mortality: A population-based retrospective cohort study. *CMAJ Open* 2014;2:E77-85.
- Wiens MO, Pawluk S, Kissoon N, Kumbakumba E, Ansermino JM, Singer J, *et al.* Pediatric post-discharge mortality in resource poor countries: A systematic review. *PLoS One* 2013;8:e66698.
- Koffi AK, Libite PR, Moluh S, Wounang R, Kalter HD. Social autopsy study identifies determinants of neonatal mortality in Doume, Nguemendouka and Abong-Mbang health districts, eastern region of Cameroon. *J Glob Health* 2015;5:010413.
- Murray CJ, Lozano R, Flaxman AD, Serina P, Phillips D, Stewart A, *et al.* Using verbal autopsy to measure causes of death: The comparative performance of existing methods. *BMC Med* 2014;12:5.
- Awasthi S, Verma T, Agarwal M. Danger signs of neonatal illnesses: Perceptions of caregivers and health workers in Northern India. *Bull World Health Organ* 2006;84:819-26.
- Case ME. Abusive head injuries in infants and young children. *Leg Med (Tokyo)* 2007;9:83-7.
- Dongre AR, Deshmukh PR, Garg BS. A community based approach to improve health care seeking for newborn danger signs in rural Wardha, India. *Indian J Pediatr* 2009;76:45-50.
- Berry JG, Hall DE, Kuo DZ, Cohen E, Agrawal R, Feudtner C, *et al.* Hospital utilization and characteristics of patients experiencing recurrent readmissions within children's hospitals. *JAMA* 2011;305:682-90.
- Benjamin DM. Reducing medication errors and increasing patient safety: Case studies in clinical pharmacology. *J Clin Pharmacol* 2003;43:768-83.
- Aggarwal KC, Gupta R, Sharma S, Sehgal R, Roy MP. Mortality in newborns referred to tertiary hospital: An introspection. *J Family Med Prim Care* 2015;4:435-8.

Funding: None; Conflict of Interest: None Stated.

How to cite this article: Gupta R, Tiwari P, Roy MP, Khalil S, Kashyap A. Demographic and clinical profile of brought in dead cases to pediatric emergency department of a tertiary care hospital. *Indian J Child Health*. 2019; 6(5):242-245.

Doi: 10.32677/IJCH.2019.v06.i05.012