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From the Desk of the Editor

Optimizing Critical Care Services in ICU Deficient Bangladesh by Improving Emergency Care Delivery: Is It Feasible?

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Intensive Care Medicine otherwise called Critical Care Medicine (CCM) has a history of more than sixty years to be recognized as an independent specialty and Intensivists otherwise called Critical Care Specialists are universally trained to deal with whole spectrum of illness[1]. Intensivists in Bangladesh are in general involved in decision making regarding intensive care unit (ICU) admissions from emergency department (ED) to the ICU when decision is made by emergency medicine (EM) physician to refer a patient for ICU care.

According to World Federation of Intensive and Critical Care (WFICC), Intensive or Critical care is a multidisciplinary and inter professional specialty dedicated to comprehensive management of patients having or at risk of developing acute life-threatening organ dysfunction[2]. Critical care can occur at any point of patient contact – the pre hospital setting, the Emergency Unit, the general inpatient wards, or the ICU[3].

According to a study[4], Bangladesh had close to 3000 critical care beds (including ICUs and high dependency units/HDUs) in 2022 and there were 1.7 critical care bed per one lac population. This was one of the lowest in South Asia. Most of the ICUs are concentrated in Dhaka, the capital of the country.

Emergency Medicine as a recognized medical specialty was first documented about 25 years ago. According to European Society of Emergency Medicine (EUSEM) website, in 2001 the specialty was first recognized as Accident and Emergency Medicine by United Kingdom and Ireland, first time in Europe[5].

The ED, unlike other areas of the hospital, is an expandable place –patients are seen in the hall ways, waiting areas, and other nontraditional patient care areas during periods of surge. The ability to predict inflow and trend in patient volume is currently drawn from historic population data and daily ED patient census and arrival time data. Historic trends do not allow for real time recognition of surge conditions, which prevent EDs from distinguishing between routine versus crisis conditions.

In Bangladesh Emergency departments have been an integral part of any hospital, small or large and they have been serving various type of functions most importantly like a walk in clinic in most of hospitals both private or govt. run. If a hospital has an ICU, the critically ill patients are immediately admitted there without being treated or stabilized in ED. If no ICU facility exists, critically ill patients are directed away to go to a larger hospital with ICU[6]. EDs are generally staffed by physicians from different specialties such as internal medicine, cardiology, general surgery, pediatrics etc. Up till now Emergency Medicine (EM) as an independent clinical specialty does not exist in Bangladesh.

In Bangladesh EM is the least profitable among all services in private hospitals who do not get any subsidy or donation to render services for emergency patients. As such attention is not paid to develop quality of patient care in them and sick patients do not get stabilized in ED, rather they get admitted in ICU if facility is available. Whereas such patient if stabilized in ED could have avoided being admitted into ICU resulting in reduced burden on CCM in that hospital and also this will help the financially handicapped patients who cannot afford ICU care. This is a typical scenario in Bangladesh where facility for ICU or CCM is limited in resource as well as expensive considering low per capita income (US $ 2675 in 2023-24)[7] of average population of our country.

Most emergency services provided in Bangladesh is not adequate and poor patients are mostly affected by this fact. Lack of logistics is one important factor. Most ED in Bangladesh functions like a traffic controller. In majority ED only one emergency physician is mostly found and his job is mostly to guide patients to appropriate department and not give urgent resuscitation. In such ED adequate equipment is not present and supporting staff is not trained to give CPR or do the basic triage when patient arrives[8].

It is important to recognize that significant amount of critical care is usually performed in ED in any standard setting. Studies report that critically ill patients spend several hours in ED before being transferred to an ICU and critical care procedures are commonly performed in the ED[9-10].

Admission of patients to the ICU is often complicated by low bed availability and limited resources[11], resulting in substantial delays in ICU admission and increased mortality[12]. Therefore, implementation of critical care services in ED could potentially negate these hindrances and improve patient care.

Critically ill patients in the ED that require advanced monitoring and specialized treatment or interventions, are significantly affected by ICU overcrowding. It has been reported[13] that transfer delay longer than 6 hours from ED to ICU associated with delayed assessment and care, ICU readmission and early mortality.

As such one question comes to mind of health care planner, does optimal emergency care decrease need for ICU admission? According to Bur A[14] who did a retrospective study on 1498 patients who presented with life threatening emergencies to the ED for treatment 37% were ultimately admitted to ICU, whereas 38% were admitted to a ward and 2% were able to be discharged. Ngyuen et al[15] studied 81 critically ill patients being treated in ED and measured their

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APACHE II, SAPS II. They were able to prove that 11% of their study patients were downgraded as to a non-ICU bed after ED care despite being initially accepted to the ICU.

Studies also have shown that optimal care in ED may decrease the level of care needed in ICU. Rivers et al[16] showed that early goal directed therapy (EGDT) for severe sepsis and septic shock performed in ED before ICU admission reduced not only mortality but also need for mechanical ventilation. Giacomini M[17] showed in a short term non-invasive positive pressure ventilation (NIPPV) study on 58 patients in ED with acute cardiogenic pulmonary oedema with severe respiratory distress, endotracheal intubation and ICU admission were avoided in 43 patients.

Studies on different literature prove that optimal ED care also decreases length of ICU stay. EGDT proposed by Rivers et al[16] also reduces hospital length of stay in survivors. Several authors claim[18] that there is strong clinical evidence that NIPPV reduces the need for intubation and reduces length of stay in ICU patients with chronic obstructive pulmonary disease.

Society for Academic Emergency Medicine first proposed designated emergency centers where critical care services are provided when patients are transported for initial diagnosis and management before potential ICU admission. Such critical emergency medicine has the potential to greatly improve the outcome of critically ill patients in ED. Critical emergency medicine[19-20] is an emerging area focusing on resuscitation of unstable ED patients and refers to acute medical care of patients in medical emergency that poses immediate threat to life irrespective of as those with sepsis and shock. These centers were supposed to have appropriate ICU equipment and specialized healthcare personnel.

It has been proposed that patient care in ED can be improved by the presence of an ED intensivist, who can provide additional expertise in resuscitation and management of critically ill patient[21]. ED intensivists are responsible for management of critically ill patients until their admission to ICU.

In USA ED boarding[22] has been practiced for quite some time and it was the practice of caring admitted patients (particularly critically ill patients) in ED after hospital admission. Prolonged boarding in ED has been associated with longer duration of mechanical ventilation, longer ICU stay and higher mortality. In Bangladesh such boarding is not known to be practiced as EDs in general are poorly equipped to handle critically ill patients

Leibner et al[23] proposed a term Resuscitative Care Unit (RCU) used in ED of some US hospitals where short term critical care is provided. They are expected to replace traditional boarding[22]. In general, these ICUs provide early respiratory cardiovascular, neurologic and hemodynamic support though the transition from resuscitation in the ED to early longitudinal phase of critical illness. This flexibility in delivering early care embodies the ultimate goal of providing emergency critically ill patients' appropriate care.

Dhaka Medical College hospital (DMCH) ED few years ago opened an One-Stop Emergency Center[24] (OSEC) using similar theme of critical emergency medicine[19] and theme of RCU[23]. This OSEC has close to 15 beds with facilities of mechanical ventilation and other monitoring facilities. It has been managed under department of Anesthesia. The aim was to reduce the load on over demanded ICU by offering critical care to emergency patients so admission into ICU could be avoided or could be delayed when no bed is available in ICU. Such patient will sometimes be admitted to non-critical areas when bed shortage in ICU continues to persist. Only other OSEC in the country is currently being operated in Dhaka Mugda Hospital ED.

Studies have shown that "ICU without Walls" model[25] can be used in different wards and ED efficiently. In this model management of critically ill patients can be optimized in ED by collaboration between CCM specialist and medical emergency team.

According to Fuller et al[26] who studied management of Acute Respiratory Distress Syndrome (ARDS) in ICU, a minority of patients present to ED with ARDS. According to them ED is an entry point of for many high risk patients for ARDS development and progression. When these patients stay in ED for prolonged period of time to be admitted to ICU, there is a good window of opportunity for treatment and prevention of ARDS.

There is an ICU priority and diagnostic model classification (Table 1) outlined by Society of Critical Care Medicine (SCCM) of USA[27]. Such model should be followed while considering admission into ICU from ED especially in resource poor setting like that of Bangladesh.

Table 1

Priority 1. Unstable patients in need of intensive treatment and monitoring that cannot be provided outside of the ICUs.

Priority 2. Patients requiring intensive monitoring and may potentially need immediate intervention.

Priority 3. Unstable critically ill patients but have a reduced likelihood of recovery because of underlying disease or nature of their acute illness.

Priority 4 A. Little or no anticipated benefit from ICU care based on low risk of active intervention that could not safely be administered in a non-ICU setting (too well to benefit from ICU care).

Priority 4 B. Patients with terminal and irreversible illness facing imminent death (too sick to benefit from ICU care).

One very important requirement of man power development for ED physicians in Bangladesh is introduction of post graduate course in EM and the idea is to enhance critical care management in ED. Up till now all efforts made by Bangladesh Society of Emergency Medicine (BSEM) to introduce post graduate course under Bangladesh Medical University (BMU, former BSMMU) or under Bangladesh College of Physicians and Surgeons (BCPS) have failed. Convincing appropriate authorities to understand the dire need of such medical man power development for promoting emergency care has been a disappointing failure. A proposal is underway from department of EM of United Hospital, Dhaka to establish an MD course in EM under BMU. This proposal

if approved will be the first of its kind in Bangladesh and will produce post graduate qualified emergency physicians who will perform similar tasks done by ED intensivists or critical emergency specialist[21].

It is important to remember that most ED of Bangladeshi hospitals are thought to be a losing concern because of high fixed costs required to deliver 24-hour service. There is no health insurance or govt. subsidies[28]. Such hospital either does not or cannot provide ICU care.

In conclusion Bangladesh hospitals with ED with or without ICU facility ideally should have required equipment and trained manpower (both doctors and nurses) for critical care service delivery in the ED. This will significantly reduce the burden of admissions in ICU where demand for bed is always high. Patients who have financial hardship for ICU care will get the benefit of cheaper critical emergency medicine which will allow them to avoid high cost of ICU care. Such practice of critical emergency medicine (also facility like OSEC[24] if introduced) will mitigate scarcity of ICU beds in Bangladesh to a great extent. Private hospitals here with limited resources will get incentive to develop ED with critical care facilities only if there are Govt. subsidies or if there is health insurance available for people with limited paying ability.

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