

AN AUDIT OF INTENSIVE CARE SERVICES IN BANGLADESH

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Abstract

This study was conducted to survey the facilities, bed strength, functional characteristics, manpower, operational practices and distribution of intensive care units in Bangladesh. Direct interview of consultants in charge of different Intensive Care Units (ICUs) in the city of Dhaka was conducted by a structured questionnaire. All Adult Intensive Care Units (ICUs) and Coronary Care Units (CCUs) with ventilator support in the city of Dhaka belonging to government and private sectors were included. Our survey showed that 90% of all Intensive Care Units in Bangladesh were located in the city of Dhaka. There were 40 Intensive Care Units in the city of Dhaka, of which 33 were ICUs and 7 CCUs with ventilator support (also considered as ICU). Only 4 (10%) ICUs were located in government hospitals. Rest of the ICUs was in private hospitals / clinics. Total number of ICU beds was 424 and total numbers of beds in these hospitals were 8824. So 4.8% of total hospital beds were provisioned for critical care. Among these only 240 beds (60%) had ventilator support. 27(68%) of the 40 ICUs were multidisciplinary, 7(18%) CCUs, 5(12%) cardiac surgery and 1(2%) neurology. 64% ICUs were run by anesthesiologists. 85% facilities were open units as opposed to 15% closed units. Nurse: bed ratio of 1:1 was seen in 15(42%) facilities. On duty doctor: patient ratio was variable and highest was 1:4 in 9 ICUs (27%). ICUs in Bangladesh are mainly situated in the city of Dhaka and mostly in the private sector. The standards and management strategies vary greatly.

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Introduction

Critical care medicine is the direct delivery of medical care by a physician to a critically ill or critically injured patient. Critical illness or injury acutely impairs one or more vital organ systems such that there is a high probability of imminent or life-threatening deterioration in the patient's condition. Care of these patients can take place anywhere in the inpatient hospital setting, although it typically occurs in the ICU. Critical care involves highly complex decision making to assess, manipulate, and support vital system functions, to treat single or multiple vital organ system failure, and/or to prevent further life-threatening deterioration of the patient's condition.¹

Intensive care has emerged as a distinct speciality in the world over the last 3-4 decades.² The importance of mechanical ventilation was mostly realized in the polio epidemic in Copenhagen in 1952 where the mortality rates reduced from 90% to 40% following its introduction.³ This gradually led to the concept of Intensive Care Units.

Intensive care is a known but neglected concept in Bangladesh. The first ICU in Bangladesh was established in the National Institute of Cardiovascular Diseases (NICVD) in 1980. Since then many ICUs have emerged. In Bangladesh there is no governing body like Bangladesh Medical and Dental Council

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(BMDC) that can scrutinize standards of such units. And there are no statistics regarding the number, bed strength, facilities, strength of medical and nursing staffs, and cost benefits of these ICUs, so that relevant recommendation regarding quality of management can be made. The objective of our study was to have an overall idea of intensive care facilities in Bangladesh.

Methodology

In our study we included all the Adult ICUs in the city of Dhaka including CCUs with ventilator support (considered as ICU). 2 ICUs in Chittagong, 1 in Sylhet and 1 in Sirajgonj were identified but were not included in the study as direct interview of the consultants in charge could not be done.

We prepared a structured questionnaire and visited the units. Then consultants in-charge of each ICU were interviewed except for 2 ICUs where we obtained information from the senior medical officers.

Study period was from December 1, 2007 to December 31, 2007. All the data collected were compiled and calculated manually.

Results

The first ICU in Bangladesh was established in 1980 at the National Institute of Cardiovascular Diseases (NICVD). Since then the number of ICUs have grown steadily but mostly in the city of Dhaka which is the capital (Fig 1). A total of 44 ICUs were identified in the country. Among them, 40 ICUs were situated in Dhaka city, remaining 4 ICUs were located in other districts of Bangladesh. Of the 40 ICUs of Dhaka, 7 were CCUs with ventilator support, 36 ICUs (90%)

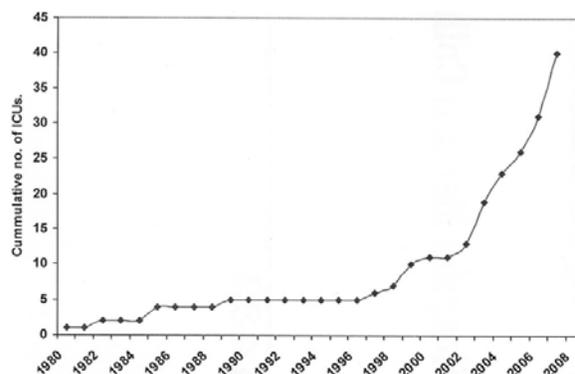


Fig-1: Trend of establishment of ICUs in city of Dhaka

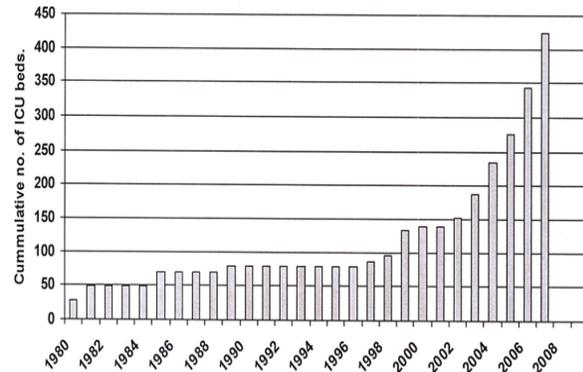


Fig-2: Trend of number ICU beds in city of Dhaka

were in private hospitals, rest in government hospitals. Total beds in these study hospitals were 8828 and total number of ICU beds was 424 (4.8%). In 1980, there were only 28 ICU beds in Dhaka city. Since then the number of ICU beds have gradually increased (Fig 2).

Of all the hospitals studied, 25% hospitals had $\geq 10\%$ beds, and 27.5% hospitals had 5-9% beds dedicated to ICU. Total number of ventilators were 240 in 40 ICUs (i.e. 56.6% ICU beds had accompanying ventilators). 25% ICUs had a ventilator: bed ratio of 1:1.

Among the ICUs, 27(68%) were designated as mixed (medical and surgical), 7(18%) were CCUs with ventilator, 5(12%) cardiac surgery, and 1(2%) neurology. 21 (64%) ICUs were run by Anesthesiologists, and 4(12%) ICUs by Critical Care Specialists / Intensivists. Rest of the ICUs had Cardiologist, or Neurologist as In-charge.

6 (15%) ICUs were closed ICUs and 34 (85%) were open units. 9 facilities (27%) had on duty doctor: patient ratio of 1: 4. In 8 ICUs (24%), on duty doctor: patient ratio was 1:5. Only 4 ICU (12%) had ratio of 1:3. A nurse: bed ratio of 1:1 was seen in 15 (42%) units. 51% ICU doctors at 27 ICUs and 36% ICU nurses at 32 ICUs were cardio pulmonary resuscitation (CPR) trained. The remaining ICUs failed to furnish the information regarding CPR training of their duty doctors and nurses.

Arterial blood gas (ABG) analysis machines were available in 70% units, routine lab facilities in 95% units, bedside echocardiography in 55% units and bedside ultra-sonography in 65% units.

Among supporting facilities, 19 hospitals had high dependency unit (HDU) support, 10 hospitals had dialysis units and 3 hospitals had CRRT (continuous

renal replacement therapy) facilities and only one hospital had bed side routine hemodialysis facility. Population of Dhaka City Corporation is 5333571.⁴ So there was one ICU bed for aprox. 12579 residents of city of Dhaka.

Discussion

This audit was first of its kind which demonstrated the status of critical care facilities in Bangladesh and more importantly areas requiring improvement.

No ICU existed in Bangladesh before its independence in 1971 and in 1980 the first ICU was established. Since then the number of ICUs has been increasing steadily but almost all are concentrated in Dhaka city. Among all the ICUs, 90 % are in private sector. This is a major drawback in providing critical care facilities to the mass population as majority of them cannot afford the cost of private hospitals. As most of the ICUs are located in the city of Dhaka, this causes great difficulties in transporting patients from the peripheries of the country to the capital.

It is generally accepted that the number of ICU beds as percentage of total number of beds in a hospital should be between 5% and 12% depending on the level of care offered by the hospital.⁵ Our survey showed 25% of the study hospitals had 10% or more beds dedicated to ICU, and 27.5% hospitals had 5-9% beds dedicated to ICU.

68% ICUs in Bangladesh provide mixed services, managing medical, surgical, gynecological and obstetrics patients.

It is suggested that a clinical laboratory should be available on a 24-hr basis to provide basic hematologic, chemistry, blood gas, and toxicology analysis. Laboratory tests must be obtained in a timely manner, immediately in some instances. Portable chest radiographs is also important as it affects decision making in critically ill patients. This leads to therapeutic changes in 66% of intubated patients and 23% of nonintubated patients.⁶ Our survey showed 95% of our study ICUs had 24hrs routine lab facilities and portable chest X-rays, and 7% ICUs had ABG analysis machines.

It is recommended that 25% of senior nursing staff should hold a formal qualification related to intensive care,⁷ and mandatory training of basic life support

(BLS) is an important requirements for all critical care nurses.⁸ In our country there is no formal training in critical care nursing and according to our study only 36% nurses had BLS or CPR training.

Several retrospective studies have shown better patient outcome and cost benefits when ICU patients are managed in closed units where all patients are cared for by one team of Intensivists in collaboration with other primary services. Only intensivists take on the senior role in a closed unit rather than in open units where primary doctors choose to admit patients and generally makes management decisions leaving the responsibility of managing machines and doing procedures to the Intensivists.⁹⁻¹⁴ 85% ICUs in our country are still open units. Predominance of open ICUs in our country is a simple reflection of the non availability of sufficient number of medical specialists in intensive care and lack of awareness about the superiority of 'closed system' among our primary care physicians who refer patients or admit patients for intensive care. Despite all efforts to collect mortality data in ICUs, it could not be done due to lack of co-operation from unit heads.

Conclusion

Through this survey an attempt was made to assess the facilities, bed strength, spectrum of management, clinical skills available in the field of Intensive care in Bangladesh and areas where improvements need to be stressed.

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