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Critically ill obstetric patients in resource-limited settings

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Critically Ill Obstetric Patients in Resource-Limited Settings

Management of critically ill obstetric patients is challenged by altered physiology of pregnancy and concerns for the viability of the fetus. Risk of serious maternal morbidity is relevant to all pregnancies and not only for known high-risk cases. Therefore, these patients require early recognition of exhibiting signs of acute deterioration, quick referral, and transportation to a higher level of care with early institution of therapy.

Unfortunately, many resource-limited countries do not have an integrated, well-functioning healthcare system to cater to the need of critically ill obstetric patients. World Bank has categorized countries based on gross national income,[1] and almost every low income country and lower- and upper-middle income countries meet the criteria of resource-limited settings.

Healthcare Systems within Low- and Middle-Income Countries (LMIC)

There exists heterogeneity in access to healthcare system of LMIC. There is discrepancy of availability of resources, healthcare personnel, and critical care facilities within a country. This is often apparent in countries having a two-tiered system consisting of both public hospitals and private hospitals. In South Africa, less than 20% of the population is served by the private healthcare system serves. However, these hospitals have 75% of the critical care/high care beds for the country.[2] The mean cost of receiving treatment in the critical care unit quoted form the private hospital of LMIC was $3300. This expenditure does not include additional treatment after the patient was discharged from the intensive care unit.[3]

Maternal Mortality and Admission to Critical Care

A quarter of a million women die every year during or after pregnancy and childbirth, and 99% of these are from LMIC with maternal mortality ratio 14 times higher than in many high-income countries (HICs).[3] Most of these deaths were due to hemorrhage, sepsis, and preeclampsia, complications of delivery and unsafe practices of abortion.[4] All these deaths were deemed preventable with timely and safe management in critical care unit.

There is a difference in the percentage of the obstetric population requiring admission to a critical care unit between LMIC and HICs; as it is influenced by socioeconomic status, criteria for critical care admission, and availability of beds.[5,6] The ratio of number of intensive care unit beds per population is 2/100,000 in developing countries compared to 30.5/100,000 in the developed countries.[7,8]

The admission rate to critical care units is below 1% (0.08–0.76%) of deliveries in HICs[9,10] and ranges from 0.13% to 4.6% in LMICs.[11-13] Mortality in these patients is high and varies from 0% to 4.9% of critical care unit admissions in HICs[9,10] and from 2% to 43.6% in LMICs.[11-13]

Challenges Face in Resource-Limited Setting for the Provision of Maternal Critical care

Maternal critical care in resource-limited setting is challenged by lack of proper health care system including inadequate supply of drugs/equipment, poor infrastructure with lack of trained healthcare personnel. In addition, it is compounded by late and severe presentation of the disease with inadequate system of referral and transportation. Resource-limited countries face these challenges due to lack of funds to cover healthcare costs both on individual or social basis.

Early intervention is the only way to improve maternal outcome but unfortunately in resource-limited setting there are delays; First delay occurs in seeking care, that's when patients wait to seek healthcare because of financial constraints, cultural beliefs, poor education, or low awareness of available services, etc. The second delay is the delay in reaching care, which occurs when hospitals with surgical capacity are scarce in primary and secondary healthcare centers, and the nearest facility can be hours or days away. The third delay is in receiving care that occurs when reaching a hospital does not guarantee treatment, since few first-level hospitals can provide comprehensive surgical care.

Factors that can Improve Outcome in Critically Obstetric Patients

Education and awareness of patients and families

In resource-limited settings, delay in care seeking and substandard care at health facilities influences outcomes.[14] Strategies for educating pregnant women and their families about the importance of presenting at the healthcare facility as a first response to the onset of symptoms related to complications can improve outcomes.

Improving infrastructure of primary and secondary healthcare

Most of the primary and healthcare have limited access to medications, equipment, and supplies. There is poorly developed infrastructure with problem of electrical and water supply. There is a need to have simple equipment, such as stethoscope, manual blood pressure devise and self-inflating bag valve mask resuscitation devises, and pulse oximeter. The World Federation of Societies of Anesthesiologists

strategy of global availability of a pulse oximeter in every operating room can be extrapolated to have availability of pulse oximeter for care of critically ill obstetric patient.[15]

There are severe deficiencies in staffing of trained health personnel as evident from WHO report; indicating more than 57 countries with critical health professional shortages.[16] Training healthcare personnel such as doctors and to nurses to identify appearance of signs of physiological deterioration by using checklist of scoring system initiate certain treatments and make a decision of early referral may have a positive impact.

Identifying obstetric patients at risk of becoming critically ill is now considered an important factor in improving maternal mortality.[17] Most of the time parturient ending up in care have no prior risk factor, reflecting the fact that the risk of serious maternal morbidity is relevant to all pregnancies, not only those judged to be at high obstetric risk.[18] Therefore, there is a need for a simple bedside assessment tool to identify patients at risk and also for those who are already critically ill. These tools are based on physiological parameters, such as systolic blood pressure, respiratory rate, heart rate, temperature, and level of consciousness. These tools can be beneficial for LMICs, where there is unavailability of specialized test and laboratory services due to lack of resources.

Obstetric Early Warning Score is maternal early warning system, which is designed and validated by Carle *et al*. by utilizing the retrospective analysis of 4440 obstetric admissions to critical care units in the United Kingdom.[19] This bedside assessment tool is designed to identify parturient at a higher risk of severe complications, by recording some maternal vital signs, level of consciousness, and pain score every 12 hours.

Shock index (SI) is disease-related obstetric scoring system and is defined as the ratio between heart rate and systolic blood pressure. It has shown to be a useful and reliable tool to detect and/or predict hypovolemia and early hemodynamic compromise in obstetric patients, even when the individual vital signs are within normal values.[20,21] It is recommended by the authors that a SI threshold of 0.9 indicates the need for referral, 1.4 indicates an urgent need for transportation to a higher level of care, and a value of 1.7 indicates toward the high likelihood of adverse outcomes.[22]

Early transportation of patients to a higher level of care far from the primary healthcare facility

As most patients rely on government funding for healthcare; therefore, government hospital needs to be equipped and have efficient system of providing early initiation of these patients. One of the government hospitals with a tertiary care status in South India ends up providing care to 1.7 million patients per year with 44% referred from primary healthcare, which were ill equipped to manage obstetric emergencies. The retrospective data from this hospital show a maternal mortality rate of 13% with 86% of mortality in patients who had to travel more than 50 kilometers.[23]

Conclusion

There are many challenges face by resource-limited countries in taking care of critically obstetric patients. Patient and family education is important to seek early medical help. There is a need to upgrade the primary and secondary healthcare units in terms of equipment and trained staff to pick up early signs of deterioration and provide early treatment. If there is a need of referral, an early transportation to tertiary care center should be arranged. Therefore, there is also a need to improve the referral system and transportation. In addition most of the people rely on government funding for treatment; therefore, the government hospital should have enough funding and capacity to cater to the need of masses.

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