

Paediatric Emergency and Critical Care

Introduction

Paediatric critical care is not a well-established pediatric specialty in Papua New Guinea at present. Much of this can be explained by this area of paediatrics not being prioritized. Most of the burden of deaths and morbidity among children in Papua New Guinea are from conditions such as Neonatal conditions, Pneumonia, Diarrhea, Malnutrition and TB which are all largely preventable with low cost primary health care measures. There is however, some evidence that critical illness is contributing to considerable number of under-5 deaths, and that interventions as critical care need not be expensive, but cheap and sustainable for LMIC.

Definitions: Critical ill child and PICU

As a definition, a *critically ill* child is a child who is presenting with an acute or complex, rapidly changing, and progressive medical, surgical or traumatic condition. A child in whom prompt interventions are needed with close monitoring of his/her progress as integral components to the care.

A paediatric intensive care unit (PICU) is any set up that is designated to providing this care.

Major Components of Paediatric Critical Care

Triage and Emergency Treatment

The first part to critical care is the Triage and Emergency Treatment. This entails appropriate and timely identification of disease acuity and administration of prompt lifesaving treatments eg. oxygen or a bolus if intravenous fluid. It is important that the most experienced officer on shift is triaging to ensure the sickest children are identified earlier and given emergency treatment. Triage is a 24 hours, 7 days a week function. When done well, triage and emergency care can halve the in hospital mortality.

Acute Care

Immediately following triage and emergency care there is a window of opportunity to make a lot of headway in ensuring survival and/or reducing morbidity in the way of acute care. This is referring to timely administration of a lifesaving emergency intervention that is needed eg. insulin infusion, pericardial tap, snake bite antivenom, poisoning antidote, laparotomy, etc. Often these measures are delayed because rapid diagnostics aren't always available readily. Hence with the advances in the accuracy in point of care testing capabilities, these critical condition can be diagnosed early and acute care instituted without delay.

High Dependency Care

The final component to pediatric critical care is the high dependency care. This is concerned with monitoring, organ support and definitive treatment as well as symptomatic care. The emphasis in LMIC should be on adequate and high quality monitoring as early detection of deterioration is important to avoid irreversible or more resource intensive deterioration/status of the child. Due to high costs, poor expertise, limited resources in providing higher levels of critical care example extracorporeal membrane oxygen in LMIC, it may be sensible to be more pre-emptive in the management as a culture of practice in the approach to critically ill children in LMIC.

Some guiding principles to manage critical care services for children in Papua New Guinea

The following are recommendations that can assist in program approach to the local pediatric critical service in hospitals in Papua New Guinea who will receive referrals or presentation. These are by no means exhaustive of all required measures;

- Strengthen and improve triage, emergency treatment, high dependency care in each hospital
- Use local clinical data to tailor PCC in your setting
- Assess what is the local ceiling of care. Can it be raised?
- Develop national protocols for paediatric critical care
- Referral guidelines should be in place to guide decisions on referral
- Ensure staff training and refreshers are ongoing

Conclusion

Paediatric critical care is much needed in Papua New Guinea. Moreover, a systematic or structured approach to strengthening and developing this service in provincial hospitals is especially important. Though challenges remain and priorities may differ, aiming for basic, low cost and effective design to locally tailored needs for the sickest children has the potential to produce favorable results. That in itself is encouraging and worth all Paediatricians looking into.

References

1. Rola Hallam, Mohammad Jobayer Chisti, Saraswati Kache and Jonathan Smith, paediatric intensive care in resource-limited countries. Update in Anaesthesia | www.wfsahq.org/resources/update-in-anaesthesia
2. Kalter HD, Schillinger JA, Hossain M, Burnham G, Saha S, de Wit V, et al. Identifying sick children requiring referral to hospital in Bangladesh. Bull World Health Organ (1997) 75(Suppl 1):65–75.
3. Aikhionbare A, Yakubu HA. Mortality pattern in the Emergency Paediatric Unit of Ahmadu Bello University Teaching Hospital, Zaria, Nigeria. Central African J Medicine. 1989;35(5):393-6.

4. Agrawal A, Gandhe M, Gandhe S, et al. Study of length of stay and average cost of treatment in medicine intensive care unit at tertiary care center. *J Health Res Rev* 2017;4:24–9.
5. Molyneux E. Paediatric emergency care in developing countries. *Lancet* 2001; 357: 86–87.
6. Turner HC, et al. Achieving affordable critical care in low-income and middleincome countries. *BMJ Global Health* 2019;4:e001675. doi:10.1136/bmjgh-2019-001675

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