

Mortality Review: Death of a Four-month Old

Brief Assessment

A 4 month old girl, discharged from the Bayalpata hospital seven days previously on amoxicillin for presumed pneumonia, returned to the hospital from her village two hours away in respiratory distress. The child had been well until seven days prior, when she developed cough and fever and was brought to the hospital. There she was diagnosed with pneumonia and prescribed amoxicillin by Nyaya staff. In the interim period, the child did not get better, and her parents brought her to a local lay practitioner and a faith healer. On arrival back to the Bayalpata hospital, the baby was irritable, respiratory rate was 70 with severe retractions. The Nyaya team started oxygen by face mask, ceftriaxone, and IV hydrocortisone. Within ten minutes of initiating therapy, however, the child became apneic and pulseless. Resuscitation with bag mask ventilation was unsuccessful. The fundamental issue with this case was not the acute management of septic shock, which was handled appropriately given the current lack of intensive care unit level care. Rather, the main preventable systems issue was the lack of follow-up of a child with pneumonia who presented originally to the Bayalpata hospital and died seven days later.

Top possible causes of death

In the absence of culture and autopsy data, it is nearly impossible to determine the cause of death. Possible etiologies include:

- 1] bacterial pneumonia and/or sepsis, with or without amoxicillin resistance and in the context of possible decreased adherence to amoxicillin
- 2] atypical pneumonia
- 3] PCP pneumonia, tuberculosis (HIV status is unclear)
- 4] viral pneumonia

Systems-level Analysis

Nyaya Health assesses the root causes of mortality within the following levels of analysis questions.

1) Clinic operations

Staff felt that patient was triaged effectively and seen by the physician in a timely manner and with sufficient resources and time to evaluate the patient. This case made clear, however, that we must operationalize further observation and evaluation of acutely sick younger children since follow-up remains so challenging.

2) Supply chain

In this case, the medicines that staff felt were needed were available. No supply chains issues were identified.

3) Equipment/machinery

a] We lack full resuscitation and ventilation equipment, so that when a child presents in septic shock, there is often little we can do at that point.

b] We currently lack resistance testing for epidemiological assessment of resistance among community acquired pneumonia pathogens. It is unquestionable that there is significant drug resistance in rural Nepal. There are plenty of studies at least with typhoid, which is the best studied (and more easily culturable) pathogen, and there are very high rates of multidrug resistance, exacerbated by the prescription patterns of quack practitioners.

4) Personnel and Communication

There were no identified gaps in communication between providers.

5) Outreach and Patient Education

Outreach is ultimately the systems issue that was at the heart of this child's demise. The child's community lacks a community health worker who could have helped counsel the patient on adherence, identified warning signs, and ensured more timely care. Furthermore, Nyaya currently lacks a dedicated medication adherence counselor and relies on our providers, whose time is limited, for adherence counseling.

6) Societal

The trust and use of faith healers and quack practitioners is pervasive throughout Achham. Patients often use their services in parallel with or at the exclusion of allopathic medicine. Developing effective

strategies to engage faith healers and quack practitioners as individuals with significant community trust but preventing their dangerous or counterproductive practices has been challenging. It is unclear to what extent the fact that the patient was a female, as female children are undervalued in rural Achham, played a role in her delays in getting follow-up treatment. We know this to be a common problem, however.

7) Structural

As with so many of our patients, the poor roads and entrenched poverty prevented follow-up care from being initiated at an earlier date.

Final Evaluation and Response

The primary systems issue that likely contributed to this tragedy was the lack of follow-up for a child originally hospitalized and treated for pneumonia. To prevent similar deaths from occurring in the future, Nyaya Health will undertake the following systems-level changes:

1] All children under the age of six months or under the age of five years with any signs/symptoms of malnutrition and treated for pneumonia will remain in the hospital for a 24-hour observation period to assess clinical response. Clinical response measures include: perfusion status (capillary refill, extremity warmth), respiratory rate, and respiratory work of breathing (grunting, flaring, retractions).

This is of course in addition to clinician assessment of acutely sick children, which may warrant extended hospitalization.

This is not a trivial measure, owing to the risks of infectious disease transmission in hospital settings. However, the risks of outpatient treatment of the under-six-month old with pneumonia in a setting where patients typically travel several hours to reach the hospital, and use non-licensed practitioners extensively, outweigh the risks of inpatient treatment.

2] Nyaya will continue to work with our existing community health workers to follow-up all children under the age of five years old who are diagnosed with pneumonia, to identify signs and symptoms of clinical failure to antibiotics.

3] Nyaya will work on improving our outcomes monitoring of pneumonia, to better assess programmatic effectiveness.

4] Nyaya will identify strategies to improve adherence to medicines for patients discharged from the hospital.