

Dealing with Acute Febrile Illness in the Resource Poor Tropics

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Abstract

Diagnosis of infectious disease, similar to any other illness is based on history taking, examination, basic investigations and confirmatory diagnostics. However differences in clinical presentation based on evolution of aetiological agents or host factors, risk of exposure for re-emerging or emerging agents due to expanding human activities and travel has posed a great challenge on timely diagnoses of these illnesses especially in the resource poor tropical setting. Significant overlap of symptoms, signs and basic laboratory parameters of most of the tropical illnesses add to the challenge. Although confirmatory diagnostics are mandatory in the definitive diagnosis of tropical fevers their applicability, non-availability or non-accessibility has lead to a clinical based approach for the presumptive diagnosis of febrile illness. Such an approach may lead to inadequate clinical evaluation, delay in the diagnosis, and use of inappropriate antibiotics, extended morbidity and possibly avoidable mortality by other tropical diseases especially during busy disease outbreaks.

Keywords: Acute febrile illness; symptoms; Epidemiology

Diagnostic Approaches, Feasibilities and Problems Encountered

Diagnosis of infectious disease, similar to any other illness is based on a history, examination, basic investigations and confirmatory diagnostics [1]. However differences in clinical presentation based on evolution of aetiological agents or host factors, risk of exposure for re-emerging or emerging agents based on human behaviour, local or international travel, agricultural activities, animal farming or recreational activities, travel of aetiological agents via migratory birds or with transportation of goods and, changes in vector densities based on global warming or human activities has posed a great challenge for their diagnoses. This challenge is especially encountered in the resource poor tropical setting and when compared to the other well streamlined management protocols of non-communicable diseases.

Clinical decision-making plays a major role in the disease diagnosis in resource poor tropical setting. Clinical decision making must include processes such as pattern recognition, hypothetico-deductive reasoning and intuition. Only the combination of three of these approaches can help the clinician and the patient. One standard rule for this task is Bayes's theorem. The pre test probability is either the known prevalence of the disease or the clinician's subjective impression of the probability of disease before new information is acquired. The post-test probability, the probability of disease given new information, is a function of two variables, pre test probability and the strength of the evidence, measured by a likelihood ratio.

The prevalence of most tropical illnesses is known in a given geographical locality. There is significant overlap of symptoms, signs and basic laboratory parameters of most these illnesses such as viral fevers, rickettsial infections, leptospirosis, malaria and salmonella infections [2,3]. This pose challenges to the clinician's subjective impression of the probability of disease especially when confronting an individual patient. Furthermore, clinician's subjective impression to febrile illness is likely to get dampen down during labour intensive disease outbreaks or when clinicians are blinded by epidemiological data [4,5]. For example, in malaria endemic areas most febrile presentations have been attributed to malaria [6] even when the blood films had been negative and ignored other possibilities leading to delay in the diagnosis, extended morbidity and possibly avoidable mortality [6].

Furthermore, patients with rickettsial arthritis have been overlooked during chikungunya outbreak [7]; fever and thrombocytopenia due to malaria had been considered dengue in dengue endemic regions [8]; fever and late onset diarrhoea had been attributed to be typhoid when the illness was due to rickettsioses [9]. Most of such lapses had been due to inadequate clinical evaluation at the time of history taking or examination [7-9]. Furthermore epidemiology based approach is likely to result in the use inappropriate antibiotics at very early stages of infection. Such behaviours are known to interfere with evolution of the illness process, mask symptomatology, alter confirmatory diagnostics [3], and also make patients vulnerable to harbour multi drug resistant organisms. Although confirmatory diagnostics are the key to definitive diagnosis of tropical fevers, their non-availability or non-accessibility [1,2,4] has lead to above consequences. However, integration of curative and diagnostic services within existing health system could help avoiding over diagnosis and overtreatment of febrile illness.

Confirmatory diagnostics play a key role in both patient management and evolution of epidemiology. However most confirmatory diagnostics that are freely available in the tropics are based on serology and they carry a retrospective diagnosis [3]. In addition, back ground sero-prevalence, variable but long term persistence of IgM antibodies [3], delayed appearance of antibodies [10], occurrence of cross reacting antibodies, early antibiotics treatment related damping down of antibody responses make it difficult to interpret the serological results. Therefore, definitive diagnosis requires demonstration of a four-fold rise in antibody titres against a causative agent within a specified period of time [1,3]. However, non-compliance of patients to report for a repeat serological testing following improvement of the illness remains a major drawback in the serology based definitive

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diagnostics. The value of point of care tests such as multi-tests strips in the diagnosis of acute febrile illness has been proven to be effective in the tropical setting due to the above reasons [11]. Although antigen based or PCR based diagnostics are increasingly introduced in order to overcome problems posed by serology based diagnostics, their availability and affordability in the resource poor tropical countries is limited [3,5]. Furthermore, as they should be performed early in the infection [3] timely presentation of patients for medical care where these diagnostics would be available can be limited. Furthermore, they incur significant cost for healthcare budgets and therefore, are not freely available in most government institutions [5] and will be accessible for a limited population in developing or under developed countries [12]. However, until such time these facilities are widely available, preventive programs with improved personal hygiene and intensive health education could help to control acute febrile illness in poor tropics.

Therefore, non-availability of proper investigation facilities in the resource poor tropical setting seems to interfere with definitive diagnosis of aetiological causes of tropical fevers [1,3]. This in turn seems to interfere with epidemiological data in these regions. Therefore initiatives should be taken to establish definitive diagnostics of febrile illnesses in the tropics. Such an approach is a fast need in order to face the challenge posed by the evolution of febrile illness as a result of globalization and changing ecological patterns.

Conclusions

Until such time these facilities are made available, infectious disease specialists should ensure a good knowledge on local, regional and global epidemiology, however, inarguably and more importantly they should have a good clinical sense, broader thinking and an open mind in order to tackle an individual patient. They also should be encouraged to establish collaborative research with centres where resources are available. Such an approach not only helps in the management of individual patients but also helps in the progress of epidemiology of febrile illness in the resource poor tropical setting.

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