

Outbreak Investigations: Lessons to be Learned

Current status of outbreak investigations of both known and unknown diseases in India is pathetic, to state the least. Outbreaks of 'acute brain diseases' are regularly reported from different parts of the country. The states of Andhra Pradesh, West Bengal, Uttar Pradesh, and Gujarat are particularly prone to get affected by certain 'unknown' brain diseases that defy proper identification and the most convenient tag offered to them is 'acute viral encephalitis syndrome' of undetermined etiology. There are instances where two sets of investigators investigated the same cohort of cases and had come out with altogether incompatible diagnosis! On other instance, the isolation of a microbial agent was discarded as a mere lab contamination. Affairs have deteriorated to the extent where publications of results in reputed medical journals are viewed with certain amount of disbelief and skepticism.

While investigations of outbreaks on known diseases like Dengue, Chikungunya, Meningococcal, Leptospirosis, *etc.* do not pose many problems, it is the investigations of outbreaks of 'unknown' illnesses that not only test the competence of the investigating agencies but pose a great challenge to their reputation. However, the approach adopted by many such agencies while dealing with these diseases is quite flawed and narrow. The usual knee-jerk reaction is to dub them as 'acute encephalitis', particularly if the disease involves the brain without even first devising a proper case definition and investigating risk factors. This lack of 'epidemiology intelligence', a term used recently by an eminent infectious disease expert, is most obvious reason of our failure.

What is lacking?

Properly coordinated investigations with detailed epidemiological studies that followed preliminary investigations and exhaustive microbiological workup have been lacking in the country. The

situation is akin to five blind men describing an elephant. The inertia (delay in establishing the investigational setup) displayed by investigating agencies and institutions is another reason why media take charge of the situation and create havoc among the public. Lack of adequate research facilities at district level is the reason why investigations are delayed and crucial time is lost.

What is needed?

There is an urgent need to streamline outbreak investigations in our country. A joint concerted team effort-comprising a team of a principal clinical investigator, epidemiologist, clinical pathologist, histopathologist, virologist, entomologist, forensic specialist, and community health experts is needed. There is need of sticking to the well-established norms of outbreak investigations which includes first establishing a proper 'case definition' with exclusion of certain other confounding illnesses, identification of risk factors, proper investigation of the case including autopsy and histopathological workup whenever required, and detailed microbiological investigations. Depending upon the findings of initial investigations and identification of risk factors, a thorough community based epidemiological studies must be planned and carried out in every outbreak. The customary practice here is that after declaration of an outbreak, usually by the media, the investigating teams arrive, collect few biological samples, visit few households, and take entomological information and process them. If they found some incriminating agent, usually a virus, they proceed further with more investigations. However, if no microbial agent is found and brain is affected in the outbreak, the illness is clubbed with 'acute viral encephalitis syndrome' of unknown etiology, without exploring the other causes, particularly the non-infectious ones. A glaring example of this approach is provided by the investigation of recurrent annual outbreaks of acute fatal brain disease in many districts of western Uttar Pradesh, Uttarakhand and Haryana where more than 500 young rural kids are dying every year. Despite conducting investigations for many years the

agencies could not pinpoint the exact cause.

The western UP prototype: An experience worth emulating

In the above mentioned incident, two IAP members came forward and collaborated with a clinical pathologist and an epidemiologist of different institutions to start investigations. They not only first established a clear 'case definition' but proceeded further to define the disease by histo-pathological examination and came out with an entirely new disease entity. Later, after identifying specific risk factors through systematic epidemio-logical studies, they concluded that the deadly disease, described hitherto as 'viral encephalitis' was not even an infectious entity but a multi-system disease termed as 'acute hepatomyoencephalopathy' caused by consumption of pods (fruits) of a locally prevalent weed called *Cassia occidentalis*. Simple preventive measures such as public education should be adequate to prevent future occurrence of the disease.

What role IAP can play?

Indian Academy of Pediatrics (IAP) owing to its presence in almost every district of the country can help local health authority in carrying out surveillance, investigations, and proper case management of the cases affected by the outbreaks. As exemplified by western UP episode, IAP

members can even take lead in investigation of the epidemic. IAP has now decided to play a proactive role in the affected states by apprising the state health ministries about the exact etiology of the outbreaks in western UP and other neighboring states. IAP will assist them in surveillance, case management, and public education. Through its members and branches, IAP should be able to succeed in creating mass awareness about the hazardous health effects of the noxious agent (the weed) through massive IEC campaigns. Similar efforts can be duplicated in other regions of the country affected by outbreaks.

Conclusion

The current status of outbreak investigations and management is quite unsatisfactory and a lot needs to be done in this field. IAP can play a critical role in collaboration with national and international agencies and other NGOs in order to help local public health establishment by resolving many snags associated with outbreak investigations.

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