

ppm(unpublished data). Patro, *et al.* [2] have also shown 64.2 % household samples and 70.9% at the retail shops ( $n=55$ ) in Jharkhand as optimally iodized samples.

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## Migraine Variant

I read with interest the case reported by Chakravarty and Mukherjee labeled as a migraine variant [1]. They describe a 4 year old boy with delayed expressive language development and episodic focal motor and language deficits lasting 10 minutes to 3 days. Many inborn errors of metabolism can have such a presentation in childhood even in the absence of overt changes on brain magnetic resonance (MR) imaging including organic acidemias (methylmalonic, propionic and isovaleric), maple syrup urine disease, ornithine transcarbamylase (OTC) deficiency, and, hydroxyl-methyl-glutaryl CoA lyase deficiency [2]. Particularly in boys, OTC deficiency is an important consideration. Lack of appropriate metabolic investigations to screen for these disorders and MR spectroscopy, together with absence of headache in the child, makes the diagnosis doubtful, at best.

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#### REPLY

The child is under review for several months now and is doing well. His speech has also improved. There has been no further episode of any focal neurological problem. These would exclude any underlying metabolic disorder.

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## Routine Immunization: Campaign or Routine?

Goel, *et al.* provide an information report on effectiveness of a campaign to strengthen routine immunization in Bihar [1]. The exercise involved massive organizational inputs in infrastructure, management and manpower. *Anganwadi* and ANM workers, ASHAs and vaccinators were mobilized and budgetary support and political commitment were forthcoming.

The chief reason for poor coverage of routine (and other) immunizations is ignorance of the parents and the family of the benefits of immunizations. If that were clearly understood there would be a demand for vaccinations. Literacy rates are high in Indian states with

impressive immunization coverage. Whereas campaigns are useful to achieve short term benefits, they are very difficult to sustain. Communities need to be educated and informed of the value of immunizations *and* other aspects of health care, with the help of *Anganwadi* and ASHA workers, school teachers and panchayat bodies and others. Minor reactions following DPT vaccine administration, often responsible for dropouts, should be properly managed and the family reassured. Supply of vaccines, maintenance of cold chain and safe injection practices must be ensured. Completeness of immunizations can be monitored with the help of a health card for every child, which would have records of vaccines administered and other vital health parameters [2]. Local officials should be charged with the responsibility of immunization and other health interventions and made accountable.

Immunizations must become a *routine* application and an integral component of basic health care of the growing child (which indeed is a crucial child right).

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## Recurring Epidemics of Acute Encephalopathy in Children in Muzaffarpur, Bihar

Muzaffarpur district, suffers repeated epidemics of acute encephalopathy in children for the past 16-17 years. An outbreak of this mystery disease, with high case fatality (63.3%) was reported in children from Muzaffarpur district, Bihar, in June 2011. We report here our findings of the investigations carried out to confirm the etiology and to describe the clinico-epidemiological features.

Clinically, the presentation indicated Acute encephalitis syndrome (AES). We studied 80 children from age group of 2-10 (median, 3.5) years belonging to low socioeconomic background. Almost all cases were from rural area. Following clinical criteria were used to select a case of AES: Rapid onset of unconsciousness in a previously healthy child after attack of convulsion, and presence of fever  $>40^{\circ}\text{C}$ .

The main presenting features were fever and convulsions (100%), unconsciousness (100%), decerebrate rigidity (50%), tachycardia (80%), tachypnea (80%), and absent splenomegaly. The CSF was normal but under raised pressure (100%). Hematological investigations revealed leucocytosis with neutrophil predominance (80%). Biochemical investigation revealed hyponatremia (90%), hypokalemia (5%), mild raised SGPT (50-100IU/L) (30%), mild raised blood urea (40-50mg/dL) (40%), and normal creatinine. Smears for malarial parasites were negative. CT scan was done in 8 cases; two showed feature of cerebral edema, rest was normal. ECG showed non-specific ST changes and tachyarrhythmia

The requisite clinical samples were collected from 55 patients and sent to National Institute of Virology, Pune and National Communicable Disease Center, New Delhi for virological testing. These included 31 CSF samples,

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59 serum samples, 19 nasal swabs, 48 throat swabs, 44 rectal swabs, 2 urine samples, 2 postmortem brain needle biopsy material by nasal route, and 1 postmortem liver biopsy specimen. All clinical samples were negative for known virus causing acute encephalitis like JE, Nipah, West Nile and chandipura virus. Some specimens were processed for the discovery of novel agents. However, no agent has been found which can be attributed to the cause of the mystery disease in Muzaffarpur [1].

The presentation, seasonal distribution, climatic condition and investigations of the cases did suggest a diagnosis of encephalopathy of heat stroke (HS), as similar picture has been described in few other studies also [2,3]. Between April and June, the climate of Muzaffarpur is extremely hot and humid ( $28/40^{\circ}\text{C}$ , 90% humidity) and most epidemics occurred at the height of temperature ( $38-40^{\circ}\text{C}$ ) and humidity (70%-80%) suggesting the possibility of HS. The number of cases suddenly decreases with the onset of rain and resultant sudden drop in temperature.

Heat stroke is a life threatening medical emergency – defined clinically as core temperature  $>40.6^{\circ}\text{C}$  accompanied by central nervous system dysfunction. It is a diagnosis of exclusion. After other similar entities such as drug withdrawal syndrome, neuroleptic malignant syndrome, septicemia, cerebral malaria, CNS infection, thyroid storm, drug toxicity (anticholinergic) have been excluded [2]. Despite the advances in last 50 years, mortality due to heat stroke continues to be as high as 10-50% [3]. Since Japanese encephalitis (JE) occurs in many parts of India, especially in outbreaks, physician and investigators have a focus on JE virus. This has not been wasteful but distracts investigators from other possible explanations and etiologies. Thus, the mystery of undiagnosed outbreaks persists [4,5]. Neuropathological study of 15 cases of autopsy of brain, conducted by ICMR during 1967 and 1968, failed to provide any stigmata of encephalitis, but confirms the presence of “encephalopathy”, caused by high environmental temperature *per se* or secondarily in association with other endogenous cause [6].