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Homoeopathic management of acute encephalitis syndrome

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Abstract
Acute encephalitis syndrome is a person of any age, with acute onset of fever and a change in mental status including symptoms such as confusion, disorientation, or inability to talk and or new onset of seizures excluding febrile convulsions at any time of year. It's very painful condition of the medical fraternity to overcome from this situation. The alternative therapy like Homoeopathy may play a vital role to minimise the sufferings.

Keywords: Acute encephalitis syndrome, Homoeopathy, Prophylactic
Abbreviation: AES (Acute encephalitis syndrome), JE (Japanese encephalitis), CCRH (central council for research in homoeopathy), AYUSH (Ayurveda Yoga Unani Siddha Homoeopathy)

Introduction

Definition: According to WHO, clinically a case of acute encephalitis syndrome (AES) is a person of any age, with acute onset of fever and a change in mental status including symptoms such as confusion, disorientation, or inability to talk and or new onset of seizures excluding febrile convulsions at any time of year [1].

Causative Agents: Viruses have been mainly attributed as the causative organism of AES in India although other sources such as bacteria, fungus, parasites, spirochetes, chemical, and toxins have also been reported to have a fair share in the contribution of AES over the past few decades.[2] Apart from viral encephalitis, severe form of leptospirosis and toxoplasmosis too make up to the list of causative factors of AES. The causative agent of AES varies with season and geographical location, and predominantly affects population below 15 years [2]. Japanese encephalitis (JE), a vector-borne viral disease is caused by a group B arbovirus (Flavivirus) and has Culicine mosquito to play the role of being the vector. Acute Encephalitis Syndrome (AES) is most widely caused by Japanese Encephalitis (JE) virus. Bihar, among 29 states in India occupies a third position, considering the number of cases of JE that are reported overall [3].

History of Aes In India: The history of AES in India emerged and amalgamated with that of the Japanese encephalitis virus (JEV) since the first report in 1955 from Vellore, Tamil Nadu. The first outbreak of JEV was reported in Bankura district, West Bengal in 1973. Thereafter, sporadic cases of AES and outbreaks found its place as the leading cause of premature deaths that were being reported.

After 2012, AES cases in India shifted its focus towards the aetiological factors. Based on the reports, Indian states of Uttar Pradesh (UP), Bihar, Assam, West Bengal, and Tamil Nadu got identified as JE endemic zones. In the year 2013, starting from the monsoon months till the end of November, 2,205 people were reported to be affected by JE, and the death toll due to JE rose up to 590 (Indian Express, November 26, 2013). Many cases of AES were reported in 2014 from the states of UP (3,329 cases, 627 deaths), Assam (2,194 cases, 360 deaths), West Bengal (2,381 cases, 169 deaths), and Bihar (1,385 cases, 355 deaths) (Indian Express, September 22, 2015). JE rose to fame as the major cause of these deaths, albeit virologists identified another causal agent in the form of 'toxin-mediated illnesses. This added a new leaf to the disease's attributes with Investigators claiming the causal agent to be a toxin which is found in the litchi fruit (Indian Express, October 14, 2014). In these cases, although encephalitis was not confirmed, pathogenesis did lead to encephalopathy with hypoglycaemia. Sixty-three percent of 390 patients suffered from hypoglycaemia with low blood glucose level of 70 mg/dl, and it was observed that only treatment for hypoglycaemia

reduced the number of deaths from 44% in 2013 to 26% in 2014. The toxin was identified as methylene cyclopropyl glycine and was found to abundance in the litchi seed. Later, though not confirmed, the rise in the toxin in litchi seeds was speculated to be due to the use of alpha cypermethrin above the minimum safety levels (Indian Express, July 23, 2014) [4].

During 2016, a major outbreak of JE and acute encephalitis syndrome (AES) occurred in the Malkangiri district of Odisha, causing 103 deaths in children, of which 37 were caused by JE and 66 by AES [5].

As per data with the state government of Bihar, 720 patients suffering from AES were admitted in hospitals, of which 586 were cured and 154 died till June 28, 2019 [6].

Diagnostic Schemes for Pathogen-Associated Aes

In clinical practices, most cases are diagnosed based on clinical manifestation, laboratory reports, neuroimaging and electrophysiologic findings. Suspected cases of pathogen-associated AES may be defined as patients with neurological symptoms ranging from headache to meningitis or encephalitis with fever of variable severity. Symptoms may include fever, headache, stupor, meningeal signs, coma, disorientation, tremors, hypertonia, paralysis (generalized) and loss of coordination. Patients with fever or altered sensorium for more than 6 h with no skin rash were included in the suspected cases of pathogen-associated AES. A probable case of pathogen-associated AES was described as a suspected case with plausible laboratory results showing detection of pathogen-specific IgM antibody from serum taken during the acute phase of illness or higher and stable titres of pathogen-specific antibody determined by ELISA/HI/neutralizing assay. A confirmed case of pathogen-associated AES is said to be one which complies with the criteria of diagnosis i.e the detection of pathogen-specific IgM antibody in cerebrospinal fluid or indication of rise in paired sera from the acute and convalescent phases of illness through IgM/IgG, HI, ELISA, neutralization test or detection of pathogenic (virus, bacteria, parasite, spirochetes and fungi) genome or antigens in the blood or other body fluids including tissues through PCR, immunofluorescence or immunochemistry [7].

Differential Diagnosis

Acute encephalopathy and acute meningitis - pyogenic, tubercular, fungal or viral - are other examples of acute central nervous system (CNS) diseases due to infectious or non-infectious aetiologies that can and must be differentiated from acute encephalitis.

In acute encephalopathy, brain pathology is noninflammatory, often biochemical; hence, CSF shows no pleocytosis. Onset is often devoid of prodromal phase and tends to be in the morning hours, with no manifestations as such till the previous evening. Changes in sensorium, seizures and upper motor neuron-type muscle tone abnormalities and abnormal movements point to cerebral dysfunction. Encephalopathy occurring in clusters is often conflated with acute encephalitis outbreak.

Acute meningitis is diagnosed when the clinical presentation points to meningeal inflammation - with fever, headache, neck rigidity, positive Kernig and Brudzinski signs and high pleocytosis in CSF. In pyogenic meningitis, CSF cells are predominantly polymorphonuclear leucocytes, while in most others, these are predominantly lymphocytes. While viral meningitis is often self-limited, bacterial and fungal meningitis do progress to severe brain dysfunction and death, if left untreated. When features of encephalitis and meningitis co-exist, the disease is called meningoencephalitis [8].

Factors which might have increased IR of AES -

1. Overcrowding with resultant worsening of environmental sanitation and difficulty in getting protected water supply might have resulted in infections spreading rapidly.
2. Some cases of AES with specific treatment might have died before a diagnosis was made and so were not removed from the AESn study group. Lack of facilities for vital advanced investigations (e.g., magnetic resonance imaging scan in a case of Acute disseminated encephalomyelitis [ADEM]) might have played a detrimental role in such cases.
3. Malnutrition is an important factor contributing to illness, and is also the most common cause of immune deficiency worldwide [9].

Prevention

- Increase access to safe drinking water and proper sanitation facilities.
- Improve nutritional status of children at risk of JE/AES.
- Vector control
- Vaccination.
- National programme for preventive and control of Japanese encephalitis / Acute encephalitis syndrome.

Several government initiatives have been undertaken to educate and improve the hygiene of people living in the JE endemic zones. Government and non-government organizations have been quiet instrumental in providing proper nutrition to the AES-affected population, as most of the affected people belong to the lower economic strata of the society. Numerous initiatives have been undertaken to help the people residing in the endemic zones by providing for alternative professions in exchange of the usual pig rearing, that could help lessen the burden of the disease, as pigs are the primary host of JE viruses. Not only this, the initiatives also include Special schools that have been set up to help children challenged by clinical sequelae of JE infection [10].

Study Done on Acute Encephalitis Syndrome

1. A study was conducted on AES in eastern India where 98 children were treated and the most common presenting features met with were vomiting, convulsions and altered sensorium. In the study bacterial meningoencephalitis was the most common aetiology followed by viral encephalitis [11].
2. Acute encephalitis syndrome (AES) secondary to scrub typhus infection is rarely seen clinically. For example, incidentally, a 50-year-old man who underwent a real-time polymerase chain reaction test was found positive for tsutsugamushi. Scrub typhus is an acute mite-borne febrile illness caused by Orientia tsutsugamushi [12].
3. A case series study was undertaken at the department of paediatrics, VIMS, Bellary. 136 Children aged 0- 15 years with fever or h/o fever (>380c), altered level of consciousness persisting for >24hrs, convulsions, change in behaviour were included as study subjects.

The predominant presenting feature was fever, followed by convulsions 102 (75%) and vomiting 85 (62.5%). A higher proportion of cases were reported during post-monsoon period 62 (45.1%) followed by monsoon 41(30.1%). Higher proportion of them had viral etiology showing up during CSF analysis, among which five got tested positive for J.E & four got diagnosed of Dengue encephalitis, which was confirmed by a thorough laboratory test profile [13].

Treatment with Homoeopathy

Homoeopathy, a system of medicine, follows holistic approach in the course of treatment patient. In clinical practice, however, practitioners frequently treat patients with chronic conditions that conventional medicine cannot adequately address, including arthritis, allergies, autoimmune diseases, or non-life-threatening acute conditions such as viral infections. Apart from this, homoeopathy also plays a vital role to prevent and treat the diseases such as dengue, acute encephalitis, chikungunya etc in the face of epidemics or endemic scenario.

Central Council for Research in Homoeopathy (CCRH), an apex body, for undertaking research in Homoeopathy under Ministry of AYUSH, Govt. of India, has been taking steps for exploring the utility of Homoeopathy in preventing/treating epidemic/endemic diseases including AES/JE. Continuous efforts are being made to document the treatment and preventive effects of homoeopathic medicines in AES/JE. The excerpts of the research finding of different studies undertaken in this area are as follows:

Basic Research

CCRH had already completed one preclinical study (2007-10) to assess the effectiveness of Homoeopathic medicine Belladonna as preventive for both in vitro and *in vivo* models in collaboration with School of Tropical Medicine, Kolkata, which concluded that Belladonna did significantly protect the suckling mice from JE infection.

Further, it has undertaken a study in collaboration with King George's Medical University, Lucknow, Uttar Pradesh to understand the action of Belladonna - Calcarea carb - Tuberculinum as combined regimen on JE. The study initiated in March 2015 is still active.

Clinical Research

Prophylactic (Preventive) Studies

CCRH had carried out research studies for prevention and treatment of JE during its epidemics in eastern parts of U.P. in 1989, 1991 and 1993. Belladonna 200, single dose was distributed as preventive to 3,22,812 persons in 96 villages in three districts of U.P. (Gorakhpur, Deoria, Maharajganj) during the period 29th Oct. to 16th Nov. 1991 in the wake of reoccurrence of JE epidemic in Uttar Pradesh (India) by a team of research workers of CCRH, New Delhi. Follow up of 39,250 persons was done and it was found that none of them reported any signs and symptoms of JE.

Apart from this the Government of Andhra Pradesh too had published about the effectiveness of homeopathic medicine Belladonna, Calcarea carbonica and Tuberculinum as prophylactic in combating Japanese encephalitis. As prophylactic drugs, Belladonna 200 on 1, 2, 3 days one dose each, Calcarea carbonica 200 on 10th day and Tuberculinum 10 M on 25th day was administered in a phased manner to all children in the age group of 0-15 years in the month of August every year for three consecutive years. This project was named B.C.T. After its commencement in 1999 the mortality and morbidity rates of J.E. fell drastically. 343 cases were reported in 2000 with 72 deaths, in 2001 only 30 cases with 4 deaths, in 2002 only 18 cases but no deaths, in 2003 and 2004 no cases were recorded.

Treatment Studies

A research unit was set up by CCRH in the premises of BRD medical college, Gorakhpur in the year 2012 for exploring the role of homoeopathic medicines in managing AES. Because of various challenges in treating this condition and less documentation and experience in this area, an exploratory observational comparative study too was conducted in the year 2012. A total of 151 children diagnosed with AES were enrolled for the study. Out of them 121 children were given standard care along with homoeopathic medicine and 30 children were kept under standard care alone. The result showed 12 (9.9%) death in the group controlled with homoeopathic interventions whereas 13 (43%) deaths showed up in the analysis of the standard care group. There was 33% reduction in death and disability in the group were homoeopathy was adopted as an intervention compared to standard care alone. The results were statistically significant.

The encouraging results of above study lead to the process of undertaking a randomized controlled trial with a total of 612 patients. Three hundred six children were given standard care along with homoeopathy and 306 were given standard care along with placebo. There was 16% reduction in death and disability in homeopathy aided section (12.7%) in comparison to placebo aided care group (28.4%) which was again statistically significant.

The homoeopathic medicines found effective for children suffering from AES are Belladonna, Stramonium, Arsenicum album, Helleborus niger, Bryonia alba, Sulphur, Cuprum metallicum, Opium and Nux vomica [14].

Conclusion

Now-a-days AES and JE are endemic in Bihar and Assam. To prevent the infection and significantly bring a decline in mortality due to JE and AES proper steps must be taken from the village level, and malnutrition, hygiene etc must be very stringently dealt with. Health facilities must be made available and early diagnosis and proper treatment could help achieve new heights in the effective management of the disease.

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