Case study

Effect of early and goal directed physiotherapy intervention on gross motor function in a child with Japanese Encephalitis: A rare case report

Abstract:

Due to its widening geographical range, Japanese encephalitis (JE) has lately been named a notifiable disease in India. The disease notification makes it easier to put preventive measures in place and manage cases. JE is a vector-borne disease that is preventable with vaccination. The virus that causes it is the Japanese encephalitis virus (JEV), which belongs to the Flaviviridae family. The present case report is of an infant of 18 months old presented with problems of decreased tone, loss of developmental achieved milestones and convulsions with severe fever. On examination there was hypotonia, lack on neck control, difficulty in rolling, low pitch cry and smile. WWE managed the child with standard physiotherapy protocol. We framed goals focusing both on preventing complications and promoting recovery. We gave treatment for a period of 4 weeks. We measured Modified Ashworth Scale (MAS) and Gross motor function measure (GMFM-88) Pre and post treatment. We would like conclude our case report by mentioning the importance early and goal specific supportive and restorative care to a child will enable him or her to take more vigorous physiotherapy care in future for restoring sensorimotor and behavioral function

Keywords:

Japanese encephalitis, Encephalitis, Physiotherapy, Rehabilitation, Goal oriented therapy, Early physiotherapy

INTRODUCTION

Japanese encephalitis is a viral infection. The virus that causes Japanese encephalitis is spread through mosquito bites. It causes significant brain inflammation. With an estimated 50 000 cases

and 15 000 deaths per year, Japanese encephalitis is one of the most common types of viral encephalitis globally(1). The disease is prevalent is larger parts of Asia. A third of patients die, and half of those who survive have significant neuropsychiatric complications(2).

Encephalitis epidemics have been documented in Japan since the early 1870s. Initially termed as type B encephalitis. Later, the virus was classified as a member of the Flavivirus genus (family Flaviviridae), which was named after the prototype yellowfever virus (Latin: yellow=flavi) (1).

JEV has a 5–15 day incubation period. The clinical disease ranges from a vague febrile sickness to a severe condition characterised by meningoencephalitis, aseptic meningitis, or sudden flaccid paralysis similar to polio (3).

The virus now has a well-established zoonotic transmission cycle involving mosquitoes, pigs, and/or aquatic fowl; humans become infected only by chance when bitten by an infected mosquito and serve as a dead-end host (4).

Japanese encephalitis usually manifests in initial stages as non-specific feverish sickness, which may include coryza, diarrhoea, and rigours. This is followed by a headache, vomiting, and a loss of consciousness, which is frequently preceded by a convulsion (1).

The haemaglutination inhibition test IgM and IgG capture enzyme linked immunosorbant assays (ELISAs)The IgM ELISA has recently been changed to a simple nitrocellulose membrane-based format, with a color change discernible to the naked eye (5).

Limiting outside exposure at dusk and dawn, dressing in clothing that exposes the least amount of skin possible, Japanese encephalitis vaccineand using insect repellents are possible measures to prevent infection(1).

Japanese encephalitis is treated with supportive care, which includes treating convulsions and high intracranial pressure when they occur. Corticosteroids have been used for many years, but an RCT of dexamethasone found no effect (6).

Physiotherapy till date is supportive. Airway, Breathing, Circulation has to be maintained. Positioning plays a vital role to prevent pressure sores (7).

Aim:

To investigate effect of early and goal directed intervention in managing child with Japanese encephalitis.

Patient characteristics:

The present case report is of an infant of 18 months old presented with problems of decreased tone, loss of developmental achieved milestones and convulsions with severe fever. Child was irritated while assessment. Later cooperated with humming music and rhymes. On examination there was hypotonia, lack on neck control, difficulty in rolling, low pitch cry and smile (Figure 1).

Fig 1: Depicting child with Japanese Encephalitis

Patient History:

Child was apparently normal till August 2021. Suddenly developed acute pyrexia with diarrhea. Parents immediately rushed the child to nearby hospital where antipyretic medications were given. As the fever was not subsiding, he was referred to our hospital where he was kept in ICU. He was given airway support. During the period of stay in intensive care unit child developed few episodes of convulsions for which medications were given and they came under control in one week. After a stay of 10 days in ICU child was shifted to ward. Physiotherapy was started from icu itself.

Physiotherapy Management:

Till date there is no specific physiotherapy protocol for Japanese encephalitis. Children with JE used to bee managed in same line as encephalitis but the results were not supporting the recovery. We felt standard physiotherapy protocol is important in managing acute cases of JE. We framed goals focusing both on preventing complications and promoting recovery. Goals and goal specific management is given in (table 1). We gave treatment for a period of 4 weeks. We measured Modified Ashworth Scale (MAS) and Gross motor function measure (GMFM-88) (8)Pre and post (table 2).

Problem identified	**Cause of the problem**	**Goal**	**Treatment strategy**	**Equipment used**
Hypotonia	Inflammation of nervous system and decreased input from brain	To develop tone in postural and phasic muscles	Facilitators techniques for Postural and phasic muscles	Bolsters, physioballs, Lap therapy
Lack of head and neck control		To enhance head and neck control	Lap therapy, vestibular stimulation	Physioballs, wedges and bolsters
Lack of efficient rolling		Promote segmental rolling	Segmental rolling facilitation on physioball	Physioballs, wedges and bolsters
Decreased pitch in cry		Improve aeration of lungs	Chest Physiotherapy	Direct handling

			and positioning strategies	
pressure sores	Inability to move because of low tone	Managing already developed pressure sores and preventing further sores	Frequent changing of positioning	Direct handling

Table 1: Depicting the Physiotherapy protocol for 4 Weeks

Outcome Measure	**Pre-Test scores**	**Post test scores**
MAS(TA, biceps, hip adductors) Rt and Lt sides	0	1
GMFM 88(Lying and rolling component)	09	34

Table 2: Depicting the Pre and post scores on day 1 and at the end of 4 Weeks.

Results:

Physiotherapy treatment was lasted for 4 weeks. Pre and post scores suggest there is improvement in child gross motor status and also tone. Chief muscles of upper and lower limb were taken into consideration. There was improvement in tone in all the three muscle groups bilaterally. Lying and rolling component was taken from GMFM 88 by keeping the condition of the child in mind.

Discussion:

Results of the present study depicts that goal oriented treatment definitely plays a major role in improving the child's functional status. These results are in line previous study by kovela etal in their study on Cerebral palsy child mentioned that goal specific management plays a vital role in improving functional status of children(9). Results of this study are also in line with the previous

study by chrristy etal on encephalitis children(10). Identifying the cause, planning goal specific strategies and regular physiotherapy starting from icu to opd helped the child in gaining some tone. Physiotherapy has to be continued for few more months to get some more improvement in the child. Mother has been also trained with specific home program using kovela etal study on mother as a rehabilitative aid(11).

Conclusion: We would like conclude our case report by mentioning the importance early and goal specific supportive and restorative care to a child will enable him or her to take more vigorous physiotherapy care in future for restoring sensorimotor and behavioral function.

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