International Journal of Contemporary Pediatrics
Kudukkan F et al. Int J Contemp Pediatr. 2021 Aug;8(8):1428-1430
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: https://dx.doi.org/10.18203/2349-3291.ijcp20212888

Case Series

A case series of neonatal human parecho-virus encephalitis with a seasonality and endemicity

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Received: 19 June 2021
Revised: 14 July 2021
Accepted: 15 July 2021

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ABSTRACT

Human parecho viruses are small, non-enveloped, single stranded RNA viruses within parechovirus genus of the large *picornaviridae* family. In new-born it can cause gastroenteritis, sepsis and encephalitis. We report case series of parecho-virus encephalitis admitted to a tertiary care centre, Perinthalmanna. Parechoviral encephalitis is an endemic disease seasonally present (May-July) in certain regions of Northern part of Kerala. HPeV are viruses that cause CNS infection in the neonatal period, resulting in white matter lesions that can be visualised with MRI. In a retrospective study, 4 newborn babies of neonatal HPeV encephalitis diagnosed on the basis of clinical and radiological findings with a seasonality were assessed. HPeV encephalitis needs to be in differential diagnosis when neonates and young infants present with seizure and sepsis. HPeV infection must be considered in infants with specific pattern of white matter change but no convincing history of a perinatal hypoxic-ischaemic insult.

Keywords: Parecho virus, Parechovirus encephalitis, MRI, EEG

INTRODUCTION

Human parecho viruses are small, non-enveloped, single stranded RNA viruses within parechovirus genus of the large *Picornaviridae* family.[1] In newborn it can cause gastroenteritis, sepsis and encephalitis. HPeV form a seasonal pattern and the incidence is the highest in the summer and autumn.[2] The incidence of HPeV has been underestimated. HPeV infections are seen in all age groups but mainly in children below 1 year of age.[3] The aim of this study is to describe the epidemiology and seasonality of these viruses. HPeV are viruses that cause CNS infection in the neonatal period, resulting in white matter lesions that can be visualised with MRI. In a retrospective study, 4 newborn babies of neonatal HPeV encephalitis diagnosed on the basis of clinical and radiological findings with a seasonality were assessed. HPeV encephalitis needs to be in differential diagnosis when neonates and young infants present with seizure and sepsis.

CASE SERIES

We report 4 neonatal cases of parechoviral encephalitis admitted to a tertiary care hospital, Perinthalmanna. All new-born babies had poor activity, irritability and seizures with EEG and MRI abnormalities with normal CSF study. All the babies were discharged within 3weeks after admission with stable general condition.

Case 1

A 3-day old term AGA male baby hailing from Kadannamanna, Malappuram was presented on 6th July 2020 with poor activity and multiple episodes of seizures. Basic metabolic and CSF study were normal. EEG taken showed bilateral central region spikes. MRI brain

revealed diffusion restriction in bilateral frontoparietal white matter. Treated with IV antiepileptic and other supportive measures and was discharged after 9 days with good general condition.

Case 2

A 4-day old term AGA male baby hailing from Kodur, Malappuram was presented on 27th July 2020 with poor activity and multiple episodes of seizure. Metabolic and CSF study were normal. EEG showed multiple spikes with generalised burst suppression. MRI brain revealed diffuse restriction in bilateral frontoparietal white matter. Treated with IV antiepileptics and other supportive measures and was discharged in 21 days with good general conditions.

Case 3

A one-day old term AGA female baby hailing from Valamangalam, Malappuram was presented on 8th may 2021 with poor activity and irritability. Metabolic and CSF study were normal. EEG showed bifrontal slowing. MRI revealed diffusion restriction in both cerebral hemispheres. Treated with IV antiepileptics and other supportive measures and discharged within 3 weeks with stable general condition.

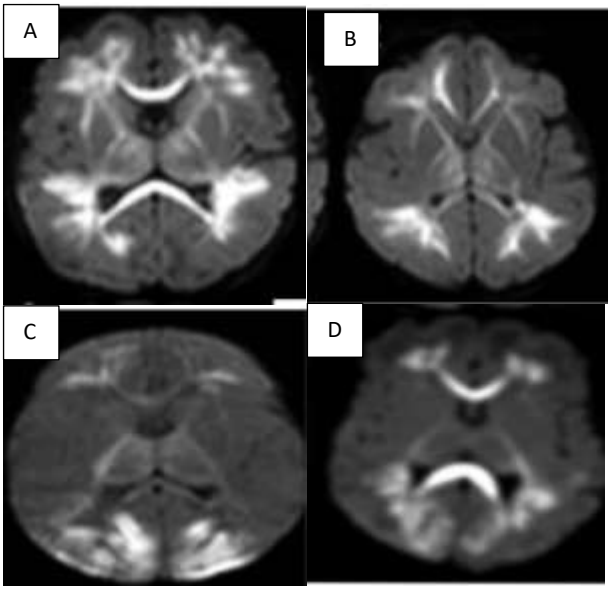

Figure 1: Axial diffusion-weighted images in patients A-D (infants with HPeV infection) demonstrate low diffusivity variably involving the periventricular white matter with frontoparietal predominance and also involving the corpus callosum, thalami, and internal and external capsules.

Case 4

A 5-day old term AGA male baby hailing from Kadannamanna, Malappuram was presented on 30th may 2021 with poor activity and seizures. Metabolic and CSF study were normal. EEG showed frequent spikes and wave discharges. MRI revealed diffuse restriction in periventricular area. Treated with antiepileptics and other supportive measures. Discharged within one week with stable general condition.

DISCUSSION

From our study with these patients showed that parechovirus infections are endemic to certain regions of Northern part of Kerala and preferential distribution for the months of May to July. The initial presentation of our patients was characterised by seizure activity. The suspicion of viral encephalitis arose from the MRI picture, showing multiple white matter lesion characterised by restricted diffusion. Verboon-Maciolek et al and Volpe reported that the HPeV RNA activates toll-like receptors in microglia, resulting in the release of inflammatory substances that injure preoligodendrocytes and axons as part of an innate immune response, as well as toll-like receptors in neurons and growing axons, resulting in direct injury.[4,6] The clinical and imaging characteristics of HPeV meningoencephalitis are characteristic in a neonate with seizure and sepsis, there is a differential diagnosis. Distinction from rotavirus, entero virus, and chikungunya infection may not be possible.[5,7,8] In contradistinction to neonates with hypoxic-ischemic injury, neonates with HPeV infection lack a history of a hypoxic event. Frontoparietal white matter–predominant low diffusivity and sparing of the basal ganglia favour HPeV encephalitis over hypoxic-ischemic injury.[4] In neonates presenting with meningoencephalitis, if CSF examination is normal, it is important to consider human parecho viruses' infection. Human parecho virus's infection must be considered in infants with specific pattern of white matter change but no convincing history of a perinatal hypoxic-ischaemic insult.[7] We have followed up on all the cases, having good neurological outcome but it may be variable, ranging from cerebral palsy to epilepsy to normal development. We reported all the cases to district surveillance officer.

CONCLUSION

HPeV encephalitis needs to be in differential diagnosis when neonates and young infants present with focal seizure, especially coming from Northern part of Kerala with a seasonality.

HPeV infection must be considered in infants with specific pattern of white matter change but no convincing history of a perinatal hypoxic-ischaemic insult.

ACKNOWLEDGEMENTS

Authors would like to thank medical records department at MES medical college, Perinthalmanna for helping with the data collection.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Kudukkan F, Athoor B, Neliyathodi F, Haweri SP. A case series of neonatal human parecho-virus encephalitis with a seasonality and endemicity. Int J Contemp Pediatr 2021;8:1428-30.