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CASE REPORT

Ramsay Hunt Syndrome Associated with Varicella-Zoster Virus Encephalitis in a Child

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ABSTRACT: Ramsay Hunt syndrome (RHS) is a triad of peri-auricular pain, ipsilateral facial nerve palsy and vesicular rash around the ear pinna. It is caused by reactivation of varicella-zoster virus (VZV) that lies dormant in the geniculate ganglia. It can be complicated by VZV encephalitis rarely. We report the case of an 8-year-old previously healthy boy who presented to a tertiary care hospital in Muscat, Oman in 2021 with fever, progressive left ear pain, vesicular rash around his ear pinna and left-sided facial nerve palsy. His course was complicated by VZV encephalitis where he was managed with intravenous (IV) acyclovir and IV corticosteroids. He improved significantly and was asymptomatic with a normal neurology examination at the 6-months follow-up.

Keywords: Varicella-Zoster Virus; Ramsay Hunt Syndrome; Encephalitis; Children; Oman.

Ramsay Hunt syndrome (RHS), which is also known as geniculate neuralgia, is caused by reactivation of varicella-zoster virus (VZV) that lies dormant in the geniculate ganglion after the primary infection with chickenpox.[1–3] It was described for the first time by James Ramsay Hunt, an American neurologist in 1907.[3] It tends to be less frequent and less severe in children compared to adults but there is limited data on how to manage pediatric RHS.[4] It is responsible for about 16.7% of cases of facial paralysis in children and it can be complicated rarely with encephalitis.[1,3,5] RHS has a low incidence in children with a rate of 2.7/100.000 in younger than 10 years of age, and is more common in children 6 to 15 years of age.[3]

Case Report

An 8-year-old previously healthy boy presented to the emergency department of a tertiary care hospital in Muscat, Oman, in 2021 with a 3-day history of fever, progressive left ear pain and swelling and vesicular rash around the left ear pinna. In addition, he had poor oral intake but no seizure or behavioural changes. There was no history of a previous chicken pox, recent travel or any sick contacts. No history of recurrent ear infections, ear trauma or swimming in a pool was given. His immunisation was up-to-date and he received the varicella vaccine at 12 months of age as per Oman's immunisation schedule.

Upon initial examination, his left ear was swollen with redness extended to the pre-auricular and postauricular area. He had vesicular lesions with red base on the outer ear canal, extending to the left side maxillary dermatome, with yellowish discharge as well as tender enlarged left cervical node (2 × 3 cm) [Figure 1]. His throat was clear and the examination of his right ear was unremarkable.

Laboratory investigations showed normal full blood count, C-reactive protein, serum electrolytes and random blood sugar. Based on the clinical findings, RHS diagnosis was made and acyclovir (450 mg orally every 6 hours) was started. VZV polymerase chain reaction (PCR) from the ear swab was reported positive while both bacterial culture and Herpes simplex PCR were negative. The patient developed lower motor neuron facial nerve palsy on day 2 of admission and later developed dizziness and he was noticed to be sleepier. On day 3 of admission, he developed vomiting, dysarthria and unsteady gait. No changes in personality, seizures, meningeal signs or motor or sensory deficits were reported. At this stage, acyclovir was switched an intravenous (IV) formulation (15 mg/kg/dose 8 hourly) and prednisolone 1 mg/kg daily was added. He also underwent an urgent brain magnetic resonance imaging (MRI) and magnetic resonance venography (MRV) and both were reported to be normal. Cerebrospinal fluid was obtained and it showed 10 leukocytes (8 mononuclear cells and 2 polymorphonuclear cells) and 2 red cells with normal protein and glucose. Bacterial culture was negative and VZV PCR reported positive from the cerebrospinal fluid. In the following few days, his ear pain, swelling, vomiting and the unsteady gait improved significantly and he was asymptomatic at discharge. He received 10 days of IV acyclovir and 7 days of predinsolone of 1 mg/kg/day. Eye care and physiotherapy was provided to the patient. He remained completely asymptomatic and had a normal MRI with no evidence of cerebral arteritis vasculopathies on the 6 months follow-up. Paternal consent was obtained for publication purposes.

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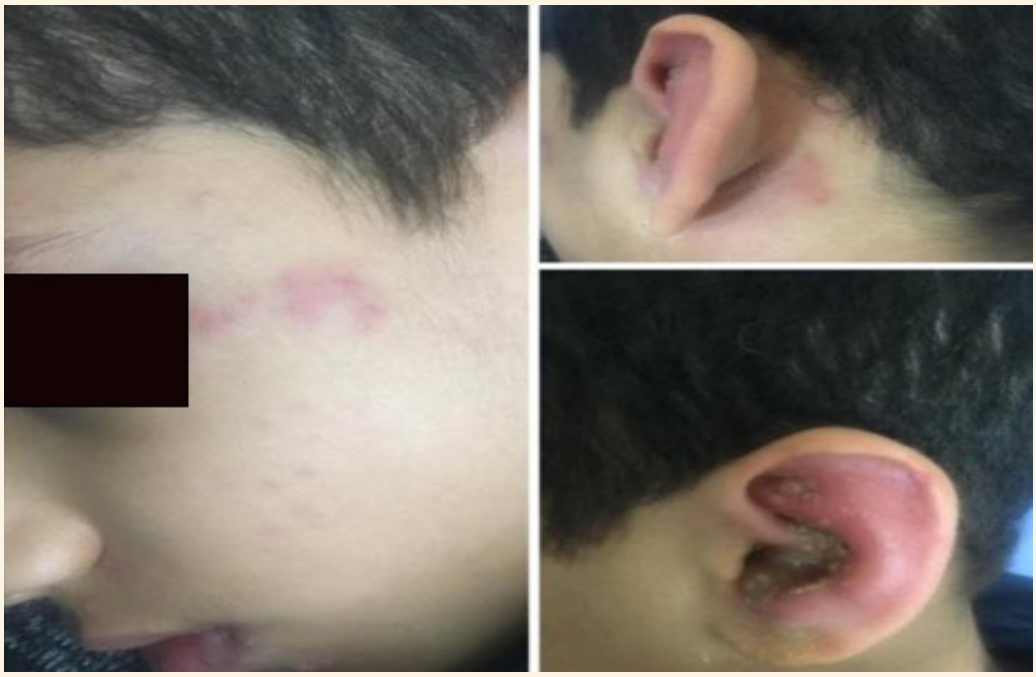

Figure 1: Photographs of the head of an 8-year-old boy showing redness, swelling and crusting of the left ear associated with vesicular rash in the maxillary dermatome.

Discussion

RHS is uncommon in children. The current patient had a classic presentation on admission. RHS is characterised by a triad of periauricular pain, ipsilateral peripheral facial nerve palsy and erythematous vesicular rash around the ear pinna and outer ear canal or in the oral mucosa.[5] The clinical symptoms begin with otalgia which can last for 1 to 3 days.[1,4,5] Facial nerve palsy usually develops within 1–2 weeks after the rash appearance.[3] RHS can affect both, the facial and vestibulocochlear nerves.[5] If the vestibulocochlear nerve gets affected, the patient can develop nausea, vomiting, vertigo, tinnitus and nystagmus.[1,5] Hearing loss is reported in 24% of children with RHS.[3] The current patient has normal hearing during his presentation and on follow-up.

RHS is usually diagnosed clinically.[3–5] The current patient presented with classic symptoms of RHS so acyclovir was started from the beginning. Laboratory and imaging investigations are not necessary to make the diagnosis most of the time and they do not affect the patient's outcomes.[5] Confirming diagnosis can be done using molecular testing from skin lesions and this can be considered when the diagnosis of RSH is doubtful. The use of serum anti-VZV IgG and IgM antibody titres is recommended for the routine laboratory diagnosis of paediatric patients with acute peripheral facial paralysis.[3,5]

Childhood immunisation with varicella vaccine can reduce the risk of getting RHS.[4] Although the current patient had varicella vaccine at 12 months of age but he still developed RHS. He has no clear history of chickenpox in the past, so RHS either resulted from a reactivation of subclinical infection in the past or because of a vaccine-related strain.

RHS has a worse prognosis compared to Bell's palsy in children.[5] Advanced facial paralysis at presentation, audiovestibular findings and delayed treatment are unfavourable prognostic factors.[1] Early treatment with acyclovir and high-dose corticosteroid therapy should be considered in all patients with RHS.[3] The combination of acyclovir (for 7–10 days) and corticosteroid therapy has been found to be more effective than treatment with acyclovir alone.[1,3,5] Acyclovir inhibits viral replication and help with rapid healing of lesions and corticosteroids help with reducing edema and pain by reducing the inflammation in peripheral neurons.[3] Hato *et al.* and his colleagues examined the recovery of facial nerve function after initiating treatment in the first three days, at 3–7 days, or later than 7-days and found that the recovery was better when acyclovir was started within 3-days of presentation. The recovery rates were 75, 48 and 30%, respectively.[6] Full recovery from RHS-related facial paralysis has been reported to vary between 27% and 70% even with early treatment.[5] The current patient improved significantly and he was asymptomatic with normal neurology examination at the 6-month follow-up after using the combination of acyclovir and corticosteroids.

The current patient's course was complicated by VZV encephalitis. He was sleepy, lethargic, and

complaining of headache and vomiting. His physical examination showed signs of cerebellar involvement manifested as a wide-base gait with unsteadiness and dysarthria. Although some of these symptoms can be explained by vestibular involvement; however, the headache, lethargy, sleepiness and wide base gait cannot be explained by vestibular involvement alone. The constellation of these symptoms along with the isolation of VZV from cerebrospinal fluid support the diagnosis of encephalitis. Although most of the reported patients with RHS associated with encephalitis, have abnormal MRI-brain, Ricigliano *et al.* reported that around 31% of patients with RHS-associated encephalitis have negative MRI-brain. Therefore, normal MRI-brain in the context of RHS-associated varicella encephalitis does not exclude this diagnosis.[7]

VZV can affect CNS disease through 3 mechanisms including acute VZV encephalitis, post-VZV cerebellitis and VZV vasculopathy.[2,5] Development of VZV encephalitis following RHS is extremely rare in an immunocompetent patient, which is the case in the current patient.[2,3,5,8] The available literature report only 6 adults with RHS complicated by VZV encephalitis and 2 of them are immunocompetent.[8–10] The authors could not find any paediatric cases of RHS complicated by VZV encephalitis. Haematogenous spread of VZV to the central nervous system or dissemination through the cerebrospinal fluid pathway has been hypothesised which could be the case in the current patient.[8]

Acyclovir-induced encephalopathy should be considered in the differential diagnosis of the current patient encephalopathy. Furthermore, this adverse effect is more common in patients with renal insufficiency, which is not the case in the current patient.[11] The main treatment of this entity is dialysis along with cessation of acyclovir.[11] The current patient showed improvement of his clinical symptoms without any dosing adjustment, and he improved before the end of the acyclovir course. Therefore, it is unlikely for his presentation to be secondary to acyclovir-induced encephalopathy.

There is limited data on how to manage VZV encephalitis. The Association of British Neurologists and British Paediatric Allergy, Immunology and Infection Group recommend giving intravenous acyclovir (500 mg/m^2 if 3 months–12 years of age or 10–15 mg/kg in >12 years of age) for management of VZV encephalitis in children for total of 10–14 days.[2] In immunocompromised patients with VZV encephalitis, prolonged course of antivirals may be required.[2] If vasculopathy present, then it is recommended to use corticosteroids with or without acyclovir.[2] The limitation of this report is the authors could not prove that the current patient had RHS-associated encephalitis because he had a normal MRI. The CSF pleocytosis can accompany nerve inflammation. The mild clinical syndrome and the normal MRI may be secondary to early initiation of antiviral therapy and corticosteroids in the current patient.

Conclusion

Careful examination and early trial of treatment with antiviral therapy and corticosteroids should be considered in children with RHS. VZV encephalitis, although uncommon, can complicate RHS in children.

AUTHORS' CONTRIBUTION

EA drafted the initial manuscript. All authors contributed to the literature review and revising the manuscript. LY supervised the work. All authors approved the final version of the manuscript.

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