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Meningoencephalitis journal pdf

AUTHORITIES Ali Khajeh 1, Batool Sharifi-Mood 2, *, Gholam Reza Soleimani 1 to quote: Khajeh A, Sharifi-Mood B, Soleimani G R. Meningoencephalitis pediatrica; A research on hospitalized patients in Zahedan, southeastern Iran, Int J Infecta. 2015 ; 2(2): e23835. 10.17795/iji-23835. ARTICLE INFORMATION International Journal of Infection: 2 (2); e23835 Published online: 29 December 2014 Article Type: Research Article Received: 22 September 2014 Accepted: 4 October 2014 Background: Meningitis is a life-threatening disease and can lead to significant sequelae. Pediatric bacterial meningitis leaves some survivors with more significant sequelae if not treated promptly. The appearance of the vaccine changed the incidence of pediatric bacterial meningitis, but these vaccines were not used in the routine childhood immunization program. Objectives: The current study aimed to investigate epidemiology, clinical characteristics, etiological agents and the clinical outcome of meningoencephalitis among the paediatric group in Zahedan, Iran. Patients and Methods: The current cross-sectional and descriptive study investigated the medical records of meningitis patients from May 2010 to May 2014. Then, patients were evaluated by sex, age, clinical characteristic, risk factor, etiological agents, acute or chronic form, and clinical outcome. Results: Of 55 patients with meningitis (42% girls and 58% boys; average age of 8.5 months, age range of 45 days to 9 years), 55 cases (98%) had acute meningoencephalitis and only one case (2%) had chronic tuberculosis meningitis (TB). Of the 54 cases with acute disease, only six cases showed a positive test for the etiological agent. Forty-eight patients had a negative CRL culture. The most common clinical symptom was fever (95%) and the least was convulsions (16%). The mortality rate was 7.2% (four cases). There were no significant risk factors in children with the disease, but there was a history of pulmonary TB in the grandmother of the TB meningitis case. Conclusions: According to the results obtained, and finding a high negative level of cerebro-spinal fluids (CSF) culture in acute meningitis, it is recommended to use systems to detect more bacteria, especially in patients whose parents use antibiotics before referring to a doctor. More specific viral tests are also needed to detect the etiological agents of viral meningitis. Keywords Result Meningoencephalitis Acute Bacterial meningitis Bacteria and viruses cause a large majority of meningoencephalitis in the pediatric group. Bacterial meningitis is the most common factor among children under four years of age, with a maximum incidence in children between three and eight months (1-3). Male infants have a higher incidence of Gram-negative neonatal meningitis, but, female infants are more susceptible to *Listeria infection* (2-4). Overall mortality for bacterial meningoencephalitis is approximately 5% to 10% and is different depending on the etiological, etiological, immunity and also the age of the patient. In newborns, mortality is higher and is 15% to 20%. Of the meningitises caused by the most common pathogens, meningitis *Streptococcus pneumoniae* has the highest mortality rate (25.3% to 30%), *Haemophilus influenza meningitis* (Hib) has the following highest rate (7.7% to 10.3%), and *Neisseria meningitidis* has the lowest (3.5% to 10.3%). For tuberculosis meningitis, morbidity and mortality are related to the stage of the disease. The significant morbidity rate is 30% for stage I, 56% for stage II and 94% for stage III. Approximately 30% of children with meningoencephalitis have neurological sequelae (4-8). This rate varies according to microorganisms and diseases, because *S. pneumoniae* has the highest rate of complications. Complications include seizures, bilateral hearing loss, and important functional behavior, or neuropsychiatric disorders. Therefore, many of the children who receive meningoencephalitis are very young and do not have cognitive and mature motor skills, some of these sequelae can not be diagnosed for years (1-5). Causal agents, risk factors and clinical results were studied by researchers, and the results were different by age and determination (1-8). Risk factors for meningitis include: skipping vaccinations, age (viral meningitis occurs especially in children under five years of age and bacterial meningitis frequently affects people under 20), community settings (children in boarding schools and child care units are at higher risk), and factors that may compromise the patient's immune system, including: acquired immunodeficiency syndrome (AIDS), the use of immunosuppressive drugs, removal of the spleen, end-stage kidney disease and diabetes mellitus (2-6). In a follow-up study of children recovering from meningitis for five to ten years, one in four school-age meningitis survivors had either severe and disabling sequelae or a hearing dysfunction that affected their performance at school (3). In infants, the signs and symptoms of meningitis are not always evident due to the child's inability to communicate symptoms. Therefore, parents, relatives and kindergarten staff should pay particular attention to the general condition of the child. If meningitis is suspected, more tests and procedures are needed to determine the diagnosis. However, treatment with early intravenous antibiotics (IV) is often started before tests (8-12). There are many reports about meningitis epidemiology, risk factors, etiological agents and clinical results (5-17). Recently, etiological agents and case mortality rates have been evaluated in two studies in Iran by Mahmoudi et al. and Azadfar et al. (8, 17). The current research aimed to study meningoencephalitis, the most common clinical manifestations, risk factors and clinical outcomes among children and young adults who have been admitted to a regional referral hospital in Zahedan, Iran. The current cross-sectional and descriptive study investigated all records of meningoencephalitis from May 2010 to May 2014 at Al-ibn-Abitalib Hospital in Zahedan (Sistan province and Baluchestan) in southeastern Iran. All patients who were evaluated in this study were diagnosed with meningitis based on clinical characteristics and lumbar puncture (LP). The criteria for inclusion were: under 18 years of age and those who had clinical manifestation for meningitis and suffered LP. Gram staining and microbiological diagnostic tests were used to detect etiological microorganisms, and when tuberculosis and viruses were suspected as etiological agents, the polymerase chain reaction method was also used. Imaging tests, including cerebral magnetic resonance imaging (MRI) and computed tomography (CT-scanning) were used prior to LP (in suspected cases of cerebral edema or mass) or when patients were suspected of complications. Patients were then evaluated by sex, age, clinical characteristic, risk factor, pathogenic microorganism, acute or chronic form and clinical outcomes. Of 55 patients with meningitis (42% girls and 58% boys; average age of 8.5 months, age range of 45 days to 9 years), 55 cases (98%) had acute meningoencephalitis and only one case (2%) had chronic tuberculosis meningitis (TB). Of 54 cases with acute disease, one case had a positive culture of cerebrospinal fluid (CSF) for *Streptococcus pneumoniae*, another case was positive for *Enterococcus sp.*, two cases were negative for the *Staphylococcus coagulase* test, and one was positive for herpes simplex virus (HSV) (detected by PCR). Forty-eight patients had negative CRL cultures. The most common clinical symptoms were fever 95%, vomiting 83%, altered level of consciousness 53%, neck stiffness 26%, deep fontanel 26%, and the least was seizures 16%. The death rate was 7. 2% (4 cases). These four cases were treated late because they showed up late at the hospital. There were no significant risk factors in children with the disease, but there was a history of pulmonary TB in the grandmother of the TB meningitis case. Cerebral edema was observed in five cases and four patients had hydrocephalus. Hemiplegia was observed in four cases and subdural empyema was reported in three cases. Meningitis is an inflammation of the meninges that surround the brain and spinal cord. Inflammation is most commonly caused by a virus or bacterium, which reaches the meninges from an infection in another part of the body through the bloodstream or from a site near the brain (1-5). Treatment and clinical outcomes are different depending on cause, age and risk factors (10-12). The results of the current study showed that in 54 cases with acute disease, one case had a positive culture of cerebrospinal fluid (CSF) for *Streptococcus* a case was positive for *Enterococcus sp.*, two cases were negative in the *Staphylococcus* clotting test, and one case was positive for HSV. Unfortunately, forty-eight patients had negative cr cultures, but treated as meningitis with ceftriaxone and vancomycin and in the ampicillin infant group has been added to this regimen. A large number of negative cultures in the hospital may be due to improper sampling and also the use of antibiotics as self-treatment by parents before being sent to the hospital. In the research of Beneteau, among 4806 cases of bacterial meningitis, 23 cases were caused by *S. bovis* (0.5%). All cases with this infection were infants and among them, 15 cases (65. 2%) occurred in the neonatal period. The majority of *S. bovis* infections occurred in premature infants (73.9%). In 21 cases, the diagnosis was based on a positive culture of CRL (16). Unfortunately, in the current study, only seven cases had positive results for the CRL test and 48 cases had negative cultures. Levy et al. conducted a survey between 2001 and 2012. They found that among 4808 patients with bacterial meningitis, 1406 cases had pneumococcal infection (29. 2%). The number of patients with this infection decreased significantly by 27.4% (P = 0.041) after pneumococcal vaccination in children (from 2009 to 2012). For children younger than two years, the decrease was 28. 2% (P = 0. 039) (4). Patients in the current study did not receive any vaccine against Hib, pneumococcal and meningococcal infections, as the Iranian health system does not immunize children against these pathogens. The study by Mahmoudi showed that the most common microorganisms associated with bacterial meningitis in children were *Streptococcus pneumoniae* (22.5%), *Haemophilus influenzae* (10%) and *Neisseria meningitidis* (10%). He reported the mortality rate and sequelae as 10% and 35%, respectively. Hydrocephalus ventricularomegaly was found in a positive case for meningitis *Mycobacterium tuberculosis* (8). Another study conducted in Iran by Azadfar et al. showed that of the 45 CRL samples taken from children, HSV-1 was detected in four (8.8%) without HSV-2 infections. Dna and PCR extraction (17) were performed to detect the virus. In this study, 2% of cases had positive results for HSV-1. In Morrill's study, the incidence of pneumococcal disease decreased significantly by 3.5% per year. Among the hospitalized patients, the risk factors for pneumococcal infection included: respiratory disease, diabetes mellitus, renal failure and invasive disease (37.4% vs. 35%, P = 0.004) and the mortality rate (14.0% vs. 12.7%, P = 0.045) were higher in unvaccinated patients compared to those vaccinated (13). Among the patients in the current study, only one case had a significant risk factor and this patient was in close contact with his grandmother, who had positive lung TB smear. In the study conducted by Namani et al. *Neisseria meningitidis* was the most common pathogen of bacterial meningitis, and bacterial meningitis was most common in the pediatric population. In the average age of paediatric cases was 3.2 years, while for adults it was 41 years (15). The average age was 8.5 months and the age range was 45 to 45 to nine years old. In all studies, fever and vomiting were the most common characteristics and seizures were the lowest. The current study had a major limitation as other studies in this city, as etiology was confirmed only in seven patients and this result was due to the limited laboratory test and the specific culture environment. The other cause of negative culture may be caused by the administration of antibiotics at the time or before the collection of specimens. According to negative cr cultures in children with acute meningitis, the CSF culture using the new systems, such as BACTEC (a blood culture system) and PCR, it is recommended to detect the etiological agents of bacterial meningitis, especially in the studied population, in which patients used antibiotics without a prescription. The authors thank all the staff who helped them collect data. 1. Chavez-Bueno S, McCracken GH, Jr. Bacterial meningitis in children. *Pediatrician Clin North Am.* 2005; 52(3): 795-810 [DOI][PubMed] 2. Grenon SL, Salvi Grabulosa MC, Regueira MM, Fossati MS, von Specht MH. 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