Mycoplasma Hominis

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We report the first case, to our knowledge, of a 4-month-old infant with meningitis caused by M. hominis in Saudi Arabia. The patient was admitted with fever and hydrocephalus and had a history of Ommaya reservoir, external ventricular drain (EVD) and ventriculo peritoneal (VP) shunt. The patient was treated successfully with intravenous Gentamicin, to which the isolated microbe was susceptible. The patient's condition improved and he was discharged in good condition after one-month hospitalization. Further studies are required to evaluate the use of molecular diagnostic tests to allow early diagnosis and treatment of M. hominis infection.

Bahrain Med Bull 2017; 39(2): 128 - 130

Mycoplasma is a free-living, cell-wall-deficient microorganism which can grow on a cellular culture media[1]. M. hominis is one of four Mycoplasma species with pathogenic potential in humans; these species include M. pneumoniae, M. genitalium, M. hominis and U. urealyticum. M. hominis may be implicated in several diseases, including urogenital diseases, postpartum fever, pneumonia, meningitis and septic arthritis[2-10]. Neonatal infection could occur as a result of transmission in utero or birth canal[6]. Invasive infection of infants with M. hominis has been described very rarely. M. hominis rarely results in meningitis in full-term and preterm infants[6,11,12]. There have been less than 10 cases of M. hominis central nervous system infection in either preterm or full term infants reported in the past 20 years[13].

The aim of this report is to present a case of an infant with fever and hydrocephalus found to have meningitis caused by M. hominis, which was managed with Gentamicin.

THE CASE

A previously healthy 4-month-old full-term male infant presented with fever and hydrocephalus. The patient had a history of hydrocephalus with Ommaya reservoir, an External Ventricular Drain (EVD) and Ventriculoperitoneal (VP) shunt. Laboratory findings showed WBC count of 15.2x10^9/L, RBC of 4.28x10^6/L and glucose level of 127 mg/dL.

Cerebrospinal fluid (CSF) contained 507 WBC, 607 mg/dl protein and 29 mg/dl glucose, which confirmed the diagnosis of meningitis. Intravenous Cefotaxime (50 mg/kg every 12 hours) and Gentamicin (7 mg/kg every 24 hours) were started as empirical antimicrobial therapy. The patient's condition improved and serial CSF cultures showed no growth of organisms on gram stain. The CSF sample obtained at the original lumbar puncture yielded a growth of typical fried-egg appearance colonies of Mycoplasma species from A8 agar plates after seven days of incubation[14]. The organism was positively identified as M. hominis by growth inhibition tests[15].

On day 14, another lumbar puncture was performed and the CSF showed 190 WBCs, 52 mg/dl of glucose and 404 mg/dl of protein. Treatment with intravenous Gentamicin was started (7 mg/kg every 24 hours) and cefotaxime was stopped when drug sensitivities were obtained for the organism. Intravenous paracetamol (10 mg/kg every 6 hours to maximum of 30 mg/kg daily) was added as required. The patient subsequently made good clinical progress for the next two weeks with a normal temperature of 37 degrees Celsius. The patient was conscious. No microorganism was detected by Gram stain, and there was continued improvement in the CSF. The patient was discharged on day 28. He was afebrile and inflammatory markers were reduced. Neurological examination revealed no adverse events.

DISCUSSION

M. hominis is a frequent colonizing organism in the genitourinary tract of pregnant women; however, an invasive infection in a neonate is rare[6]. Transmission typically occurs via the passage through the birth canal. The sites of M. hominis colonization are the pharynx, respiratory tract and external auditory canals in both sexes and the external genitalia in females[16,17].

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The organism could spread to the bloodstream and central nervous system (CNS)[6]. In our case, transmission of the M. hominis resulted from the infected mother in utero or colonization of birth canal, similar to other studies[6,18,24]. The organism can persist for weeks in the CSF with occasional spontaneous clearance[25].

M. hominis was isolated from CSF by culture method. Detection of genital mycoplasmas usually depends on culture and identification of the isolates, which was found to be the most sensitive for the isolation of both M. hominis and U. urealyticum[8,14].

Clinicians should consider mycoplasmal infection in neonates who have clinical signs and symptoms of infection with no identifiable microbial etiology or when there is failure to respond to antimicrobial treatment with β-lactam and/or aminoglycosides[8]. Several factors affect the detection of M. hominis by culture method, such as sensitivity of organisms to environmental conditions and loss of viability during collection and transport of specimens[8,19]. Mycoplasmal CNS infection in neonates may be under-diagnosed due to difficulty in obtaining positive cultures on routine bacteriologic media. Infection with these organisms should be considered if the neonates have the clinical and laboratory signs of meningitis, but negative results for routine CSF cultures[6]. Our case responded to antibiotic treatment of Gentamicin, in which the isolated microbe was susceptible, similar to another study[23].

Multiplex Polymerase Chain Reaction (Multiplex PCR) assay for rapid detection of genital mycoplasmas was considered an important diagnostic procedure, particularly among low-birth-weight infants where the organism could cause meningitis, respiratory disease and death[18]. In addition, the high morbidity and mortality rate may be attributed to delayed diagnosis and treatment[6].

A limited number of literature reviews have reported full-term neonates with CNS infected of M. hominis[6,12,13,18]. Eight out of nine reported neonates with meningitis recovered with antibiotic treatment.

M. hominis lacks a peptidoglycan cell wall and is resistant to all β-lactam antibiotics, which are commonly used in the treatment of CNS infections[6,8,13,20]. Antimicrobial agents which inhibit mycoplasma species in vitro include tetracycline, doxycycline, clindamycin and fluoroquinoles; these antibiotics have toxic side effects[13,21].Tetracycline and/or doxycycline should always be tested for susceptibility against genital mycoplasmas as resistance is known to occur in both M. hominis and U. urealyticum[14,22].

Gentamicin is a broad-spectrum antibiotic, but not generally considered the first line for mycoplasma due to the high rate of resistance. Its mechanism of action is by inhibiting protein synthesis of the organism. There are various recommendations on the use of 4 to 6 mg/kg dosage every 24 hours in the treatment of neonates[23]. A dose of 7 mg/kg every 24 hours was used in our study with no adverse effects.

CONCLUSION

This is the first case report, to our knowledge, of M. hominis in an infant with meningitis in Saudi Arabia. Our case illustrates the importance of suspecting M. hominis as a cause of meningitis if the neonates and infants have clinical signs of infection, but negative CSF bacterial cultures and if β-lactams are ineffective. Further studies on molecular diagnostics are required for rapid identification and treatment of infection caused by M. hominis.

Author Contribution: All authors share equal effort contribution towards (1) substantial contribution to conception and design, acquisition, analysis and interpretation of data;(2) drafting the article and revising it critically for important intellectual content; and (3) final approval of manuscript version to be published. Yes.

Competing Interest: None.

Sponsorship: None.

Potential Conflicts of Interest: None

Competing Interest: None

Acceptance Date: 21 March 2017.

Ethical approval: Department of Laboratory Sciences, Faculty of Applied Medical Sciences, King Khalid University, Saudi Arabia.

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