Brain abscess caused by an unusual organism, Streptococcus pluranimalium in a child with congenital cyanotic heart disease

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Abstract:
We report a case of brain abscess caused by unusual organism, Streptococcus pluranimalium in a child with complex congenital cyanotic heart disease who was successfully treated by surgical drainage and antimicrobial therapy. Streptococcus pluranimalium is a pathogen seen in chicken, birds and cattle and rarity of such infection in humans prompted us to report this case.

Introduction:
The new species, Streptococcus pluranimalium (S.pluranimalium) was first described by Devriese et al in 1999(1). The strains resemble streptococcus acidominicus and were initially isolated from bovine mastitis. It has been found to be present in milk, genital tract and tonsils of goat and cat and respiratory tract of the canaries. No human isolates have been described till date (1, 2). Hence, we report a case of brain abscess in a child with congenital cyanotic heart disease caused by S.pluranimalium which was successfully treated by surgical drainage and antimicrobial therapy, first such case to be described in literature.
Case report:

A 3-year-old boy, a known case of Taussig Bing anomaly presented with headache for 2 days and altered sensorium for 1 day. There was no history of fever or ear discharge but history of contact with chicks was present 4 days prior to admission. The child was diagnosed with complex congenital cyanotic heart disease (Taussig Bing anomaly-Double outlet right ventricle with malposition of arteries) at 40 days of life but has not undergone any surgical intervention. His gross motor developmental milestones were delayed.

On examination, he had altered sensorium and deep central cyanosis with SpO2 of 45% at room air. He was tachypnoeic with respiratory rate of 55 per minute, pulse rate was 130 beats per minute and blood pressure was 100/70 mm Hg. His pupils were of normal size and reacting to light and he was able to move his all limbs on painful stimuli. His deep tendon reflexes were brisk with bilateral extensor plantar. Cardiovascular system examination revealed short systolic murmur at left lower sternal border. Respiratory system examination revealed normal vesicular breath sounds with no crepitations or wheeze and abdominal examination revealed no organomegaly.

Investigations revealed total leukocyte count of 13000x10^3/uL with neutrophilic predominance, hemoglobin was 18 g/dl, hematocrit was 63 and platelet count was 80,000x10^3/uL.

Computed Tomography of brain showed an abscess measuring 4.6x3.5x3.4cm in left cerebellar hemisphere with midline shift and mass effect causing obstructive hydrocephalous (fig-1). Post contrast film showed mild wall enhancement suggestive of cerebellar abscess. ECHO cardiogram showed features of Taussig Bing anomaly without any vegetation in the valves. Blood culture was sterile.

Child was electively intubated and ventilated and started on intravenous ceftriaxone, metronidazole and vancomycin, supported with antiedema measures and anticonvulsants. Within 6 hours of admission, left sided craniectomy and evacuation of abscess was done. The Gram stain of the pus showed pus cells and gram positive cocci in chains as well as in groups and pus culture grew alpha hemolytic streptococcus resistant to optochin. The Vitek 2 machine showed species as streptococcus pluranimalium sensitive to ceftriaxone, and vancomycin. A day after the surgical drainage of the abscess, the child’s sensorium became normal and he had no neurological deficit. Repeat computed tomography of brain showed reduction in the size of abscess and ventricular system (fig -2). The antimicrobial therapy was continued for 6 weeks and child recovered completely without any neurological sequelae.
Discussion:

Cerebral abscess in a child with cyanotic heart disease is one of the serious life threatening complications. The brain abscess resulting from congenital heart disease, septic emboli, or meningitis have several causal organisms. The responsible bacteria include Streptococci (S. milleri, S. pyogenes group A or B, S. pneumoniae, S. faecalis), anaerobic organisms (gram-positive cocci, Bacteroides spp., Fusobacterium spp., Prevotella spp., Actinomyces spp.), and gram-negative aerobic bacilli(3). Streptococcus milleri group of organisms are the most common organisms causing brain abscess in children with cyanotic congenital heart disease(4,5). In our case, the causative organism is streptococcus pluranimalium which belongs to a group called unusual streptococcus species and other gram positive cocci (2). This new organism, S. pluranimalium was identified by Vitek 2 machine, which is an automated microbial identification system that has provided highly accurate and reproducible results in multiple independent studies. With its colorimetric reagent cards, and associated hardware and software advances, the Vitek 2 offers platform for phenotypic identification methods (6,7). This organism has been described only in case studies of animals and not in humans so far. The organism has been isolated from valvular endocarditis and septicemia in adult broiler chickens (8) and has caused meningoventriculitis in a neonatal premature calf (9).

Penicillin resistance by the viridans streptococci may be as high as 48% (2). Unlike viridians group; S pluranimalium was sensitive to most of the antibiotics in our case which includes pencillins, vancomycin, tetracycline, chloramphenicol, linezolid, erythromycin, ciprofloxacin, levofloxacin and cotrimoxazole. The child responded well to 3 weeks course of intravenous ceftriaxone followed by 3 weeks course of oral ciprofloxacin and recovered completely without any neurological sequelae.

In summary, S pluranimalium is a pathogen commonly seen in cattles, chickens and birds and can rarely cause infection in humans. But the prevalence of this infection is underdiagnosed due to difficulties with the positive identification of this organism.

S. pluranimalium is sensitive to most of the antibiotics currently used.
References:


