

# A CASE OF NEONATAL MENINGITIS CAUSED BY ACINETOBACTER CALCOACETICUS VAR ANITRATUS

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## SUMMARY

*A case of neonatal meningitis caused by an unusual organism, Acinetobacter calcoaceticus var anitratus is reported. The source of the meningitis is probably a scalp abscess caused by the same organism. This patient was successfully treated with cotrimoxazole. Infections caused by Acinetobacter are rare and are briefly reviewed in this article.*

## INTRODUCTION

*Acinetobacter* are free living Gram-negative bacteria. They can be frequently isolated from environmental sources and have been found in virtually all types of clinical specimens.<sup>1</sup> Despite this their actual role in the causation of disease is still poorly understood and their presence in clinical specimens are often the result of contamination. Reports of infections caused by *Acinetobacter* are rare. We wish to report here a case of neonatal meningitis caused by *Acinetobacter calcoaceticus var anitratus*.

## CASE REPORT

The patient was a two-day old Malay female baby who was admitted to the University Unit, Paediatric Ward, General Hospital, Kuala Lumpur on 29.3.1981. This patient was referred from a District Hospital because of difficulty in breathing and episodes of fits since birth. The spontaneous vaginal delivery was conducted at home by a midwife after a 36-week gestation. The second stage of labour was reported to be prolonged. On examination the general condition of the baby was found to be extremely poor. It was cyanosed and lethargic. Respiration was described as "grunting". A diagnosis of birth asphyxia was made.

Blood gas studies revealed a severe respiratory acidosis. The electrolytes, blood sugar and blood calcium were within normal limits. Initial blood and CSF cultures were negative.

The patient was managed as for birth asphyxia but did not make significant improvement. It continued to tolerate oral feeds poorly. On the 24th day of admission the patient developed an abscess over a drip site on the left side of the scalp. Pus drained from the abscess was cultured and grew *Acinetobacter calcoaceticus var anitratus*.

On the following day the baby developed signs of meningitis i.e. fever and a tense and bulging

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anterior fontanelle. A sample of CSF was sent for microscopy, biochemistry and culture. The CSF was heavily blood-stained, hence an accurate white cell count could not be performed. However the red cell : white cell ratio was reduced indicating the presence of increased white cells in the CSF. The CSF protein (0.65 g/L) was raised and the CSF sugar (1.5 mmol/L) was reduced. A Gram-stained smear of the CSF revealed the presence of short Gram-negative rods. The culture was positive and yielded a pure growth of *Acinetobacter calcoaceticus* var *anitratus*. The characteristics and antibiogram of this isolate is shown in Table I. Two subsequent specimens of CSF taken over the next three days also yielded the same organism.

On receipt of the CSF microscopic findings, the patient was started on parenteral chloramphenicol and cefuroxime but this was changed to cotrimoxazole (based on a dose of 6mg/kg trimethoprim) when the antibiogram was available. The CSF was sterile after 4 days of cotrimoxazole therapy. The patient made an uneventful recovery although the problem of oral feeding remained. The swallowing reflex remained poor. The patient was discharged to the District Hospital while still on nasogastric feeding on 7.7.1981.

## DISCUSSION

*Acinetobacter* are aerobic Gram-negative short rods which may sometimes resemble diplococci. They occur commonly in the environment as well as commensals on the human body. The current taxonomy for *Acinetobacter* accepts only one species, namely *Acinetobacter calcoaceticus*.<sup>2</sup> This is subdivided into two sub-species based on the ability of the organism to utilise glucose oxidatively. Those that form acid from glucose are labelled *Acinetobacter calcoaceticus* var *anitratus* (hereafter referred to as *A. anitratus*) while those that do not are labelled as *Acinetobacter calcoaceticus* var *lwoffii* (hereafter referred to as *A. lwoffii*). There has been considerable change in the taxonomy of *Acinetobacter* since it was first described by De Bord.<sup>3</sup> He placed these bacteria in the tribe *Mimeae* and described three species namely *Herellea vaginicola*, *Mima polymorpha* and *Colloides anoxydana*. Since then *Colloides anoxydana* has been reclassified as a species of *Citrobacter*. *Herellea vaginicola* is currently referred to as *A. anitratus* and *Mima polymorpha* as *A. lwoffii*. The taxonomy of *Acinetobacter* has been discussed by Henriksen.<sup>4</sup>

TABLE I  
CHARACTERISTICS AND ANTIBIOGRAM OF  
*ACINETOBACTER CALCOACETICUS* VAR  
*ANITRATUS* ISOLATED FROM THE CSF AND  
ABSCESS OF THE PATIENT

Morphology: Gram-negative short rod	
Oxidase test: - ve	Citrate: + ve
Motility: non-motile	Glucose: + ve
H <sub>2</sub> S: - ve	Lactose: - ve
Indole: - ve	Sucrose: - ve
O/F (1% glucose): oxidative	Mannitol: - ve
Growth on MacConkey: + ve	
Antibiogram:	
Resistant to ampicillin, chloramphenicol, cefotaxime, gentamicin and tobramycin	
Sensitive to cotrimoxazole, carbenicillin and amikacin.	

Infections due to *Acinetobacter* are uncommon and usually occur in the seriously ill, hospitalised patient. Glew *et al*<sup>5</sup> reviewed clinical infections caused by *A. anitratus* over a two-year period at the Massachusetts General Hospital. They found that pneumonia was the commonest infection and occurred only in patients with previous tracheostomies and endotracheal tubes. The other infections were urinary tract infections, wound infections and skin infections. Du Pont and Spink<sup>6</sup> reported 16 cases of bacteremia caused by *Acinetobacter* and noted that all occurred in patients with severe underlying illness. Pedersen *et al*<sup>7</sup> in a review of non-fermentative bacilli noted that *A. anitratus* was among the most commonly encountered of nonfermentative bacilli in clinical specimens. Urine and sputum were among their most frequent sources for *A. anitratus*.

Reports of *Acinetobacter* meningitis are rare. Watson<sup>8</sup> reviewed 45 cases of neonatal meningitis from two hospitals; one in Detroit and the other from Toronto. He found two cases of meningitis caused by *A. anitratus*. One of the cases died. Green<sup>9</sup> reported a case of *A. anitratus* meningitis in an adult female. Daly *et al*<sup>10</sup> in a review of *A. anitratus* infections in a Boston hospital recorded 3 cases of meningitis. All 3 cases occurred in adult males who had previous neuro-surgical procedures. Burrows and King<sup>11</sup> reviewed 14 cases of *A. lwoffii* meningitis. The ages of these patients ranged from 4 months to 76 years. Two of these patients developed meningitis after neurosurgical procedures. Six patients developed signs resembling the Waterhouse-Friderichsen syndrome. The

authors remarked on the similarity of *Acinetobacter* meningitis to meningococcal meningitis both in clinical presentation as well as CSF microscopy findings.

The pattern of antibiotic susceptibility of *Acinetobacter* is variable and treatment should be guided by the appropriate individual antibiogram. In general, gentamicin, kanamycin, streptomycin, colistin and tetracycline are useful antibiotics. Penicillin, ampicillin and chloramphenicol are usually inactive against *Acinetobacter*.<sup>7,12</sup> Glew *et al*<sup>5</sup> noted that while 99 percent of strains were sensitive to cotrimoxazole, only 70 percent were sensitive to gentamicin. In the General Hospital Kuala Lumpur the resistance rate of *Acinetobacter* to gentamicin is 15 percent.<sup>13</sup>

The patient in this report acquired the meningitis three weeks after admission. This is therefore an hospital-acquired infection. The meningitis was probably a result of spread from the scalp abscess. The strain of *A. anitratus* isolated was multi-resistant including resistance to gentamicin, cefuroxime and cefotaxime. It was sensitive to cotrimoxazole which was subsequently used to treat the patient. Such infections are uncommon but with the increasing importance of hospital acquired infections in this country, they may be more frequently encountered. Clinicians should be made aware of this. Isolates of *Acinetobacter* are often disregarded as contaminants both by clinicians and bacteriologists. Repeated isolates from a seriously ill patient should however alert the clinician to the possibility of such an infection.

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