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RESEARCH ARTICLE

PROVIDENCIA RETTGERI: AN UNEXPECTED CAUSE OF SEPSIS.

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Abstract

Providencia rettgeri is a member of Enterobacteriaceae that is known to cause urinary tract infection (UTI), septicemia, and wound infections, especially in immunocompromised patients and in those with indwelling urinary catheters. It is an uncommon cause of UTI and sepsis but should be suspected in patients with predisposing factors. The condition has high mortality and warrants early recognition and treatment. We present here a case of UTI with sepsis by *Providencia rettgeri* in a young female during post partum period. She had recently delivered a male baby and was catheterized for 10 days. Patient received intravenous antibiotics and recovered completely.

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Introduction:-

The genus *Providencia* is a member of the *Enterobacteriaceae* family which commonly dwells in soil, water, and sewage [1]. Human isolates of *Providencia* species have been recovered from urine, throat, perineum, axilla, stool, blood and wound specimens. The organism is usually isolated from genitourinary and gastrointestinal sources (urine, faeces and perineum), causing diarrhoea and urogenital symptoms. *Providencia rettgeri* (*P. rettgeri*) is a motile, gram-negative rod shaped organism and a member of the *Enterobacteriaceae* family [1]. It is inherently resistant to many antibiotics and thus early identification and treatment is needed to treat this infection. We present a case of urinary tract infection during post partum period in a female who had recently delivered and was catheterized.

Case report:-

A 24 year old young female presented to the OPD with history of dysuria and fever. The fever was high grade and intermittent type. The female had delivered a male baby ten days earlier by cesarian section she had been catheterised for 10 days. General physical examination was normal except for elevated temperature. Hemogram revealed TLC of 12000. Chest X ray was normal. Urine was sent for culture and sensitivity in our lab. The urine was inoculated on HiCrome agar using a calibrated loop. Inoculated plates were incubated at 35 degree C for 24 hours. Next day plates were examined for colony morphology. Gram smear showed short rod shaped cells, 0.5-0.8 µm. colonies were glossy, white 2-3mm. *Providencia rettgeri* Was isolated from urine and blood (figure 1). culture revealed that the isolate was resistant to ampicillin, ampicillin/sulbactam, cefazolin, gentamicin, and trimethoprim/sulfamethoxazole. It was found to be susceptible to ceftriaxone, cefepime, ciprofloxacin, and piperacillin/tazobactam. The patient was admitted put on iv ceftriaxone and had complete recovery.

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Figure 1:-Providencia rettgerii on blood agar

Discussion:-

The genus *Providencia* of the family Enterobacteriaceae consists of five species: *P. alcalifaciens*, *P. heimbachae*, *P. rettgeri*, *P. rustigianii*, and *P. stuartii*. Among them, *P. stuartii* and *P. rettgeri* are most commonly associated with UTIs [1,2]. *P. rettgeri* is known as one of the urinary tract pathogens causing UTI that are most often associated with long-term (>30 day) catheterization [3]. Less common infectious syndromes, especially in immunocompromised patients, include surgical site infection, soft tissue infection (primarily involving decubitus and diabetic ulcers), burn site infection, pneumonia (particularly ventilator-associated), intravascular device infection, ocular infection, meningitis, and intra-abdominal infection. In our case the patient was catheterized for 10 days only which implies that prolonged catheterization is not necessary for the infection to manifest.

Species within this genus play a role as nosocomial pathogens with other opportunistic organisms to cause bacteremia and urinary tract infections. Bacteremia is uncommon, but when it occurs, the most frequent source is the urinary tract followed by surgical sites and soft tissues [4,5]. In our patient too the sepsis was secondary to urinary tract infection. Kim and his colleagues reviewed 132 cases of bacteremia due to the tribe Proteeae and 8 cases were caused by *Providencia* species: *P. rettgeri* in 3 cases and *P. stuartii* in 5 cases. In these cases, 50% had indwelling urinary catheters but only 2 cases were clinically diagnosed as UTI; primary bacteremia in 3, biliary infection in 2, peritonitis in 1, polymicrobial bacteremia in 3.

Providencia sepsis secondary to UTI is capable of causing a high degree of morbidity and mortality [6] and carries about 20% mortality although in primary sepsis the mortality is even higher. *Providencia* species may form a biofilm, which provides specific adherence characteristics allowing for its persistence in the catheterized urinary tract and catheter encrustation. This may cause catheter obstruction and the development of struvite bladder or renal stones, which in turn may lead to renal obstruction and later serve as foci for relapse [7].

It is capable of growth on MacConkey agar, capable of catalyzing the dissociation of urea into ammonia and carbon dioxide, capable of deaminating phenylalanine, and capable of producing gas from glucose fermentation. However, most strains are incapable of fermenting lactose, a defining feature of the genus *Providencia*. *P. rettgeri* can be isolated from other non-lactose fermenters using a polymyxin-mannitol-xylitol medium for *Providencia* (PMXMP), where it forms red to pink colonies of motile, non-H₂S producers that metabolize mannitol.

Providencia species are intrinsically resistant to polymyxins and tigecycline, which are considered last resort antibiotics for resistant pathogens [8,9]. In our study, ceftiozone, ceftazidime, amikacin, imipenem, and piperacillin-tazobactam had excellent activity against *Providencia* species. Virtually all *Providencia* species can produce inducible AmpC β -lactamases, and many isolates may also produce extended-spectrum β -lactamases in nosocomial settings [10]. Plasmid-mediated resistance (e.g., extended-spectrum β -lactamases and metallo- β -lactamases) has been reported in clinical isolates [11,12,13]. The susceptibility of *Providencia* isolates should be closely monitored, and the treatment regimen should be guided by the susceptibility results in order to decrease the emergence of resistance.

References:-

1. O'Hara CM, Brenner FW, Miller JM. Classification, identification, and clinical significance of *Proteus*, *Providencia*, and *Morganella*. *ClinMicrobiol Rev* 2000;13:534-46.
2. Manos J, Belas R. The genera *Proteus*, *Providencia*, and *Morganella*. In: *The Prokaryotes*. New York, NY: Springer; 2006:585-606.
3. Warren JW. *Providenciastuartii*: a common cause of antibiotic-resistant bacteriuria in patients with long-term indwelling catheters. *Rev Infect Dis* 1986;8:61-67.
4. Goenaga MA, MaríaMorán J, Carrera JA, Garde C, Millet M. Bacteremia due to *Providenciarettgeri*. *EnfermInfeccMicrobiolClin* 2001;19:282-3.
5. Kim BN, Kim NJ, Kim MN, Kim YS, Woo JH, Ryu J. Bacteraemia due to tribe Proteaeae: a review of 132 cases during a decade (1991-2000). *Scand J Infect Dis* 2003;35:98-103.
6. Pinto V, Telenti M, Bernaldo de Quiros JF, Palomo C. Two cases of fatal transfusion-associated bacterial sepsis provoked by *Providenciarettgeri*. *Haematologica* 1999;84:1051-2.
7. Kang CI, Song JH, Chung DR, et al. Risk factors and pathogenic significance of severe sepsis and septic shock in 2286 patients with gram-negative bacteremia. *J Infect* 2011;62:26-33.
8. Stock I, Wiedemann B. Natural antibiotic susceptibility of *Providenciastuartii*, *P. rettgeri*, *P. alcalifaciens* and *P. rustigianii* strains. *J Med Microbiol* 1998;47:629-42.
9. Tumbarello M, Citton R, Spanu T, Sanguinetti M, Romano L, Fadda G, Cauda R. ESBL-producing multidrug-resistant *Providenciastuartii* infections in a university hospital. *J AntimicrobChemother* 2004;53:277-82.s
10. Prentice B, Robinson BL. A review of *Providencia* bacteremia in a general hospital, with a comment on patterns of antimicrobial sensitivity and use. *Can Med Assoc J* 1979;121:745-749.
11. Fass RJ, Barnishan J, Ayers LW. Emergence of bacterial resistance to imipenem and ciprofloxacin in a university hospital. *J AntimicrobChemother* 1995;36:343-353.
12. Woods TD, Watanakunakorn C. Bacteremia due to *Providenciastuartii*: review of 49 episodes. *South Med J* 1996;89:221-224.
13. Murray T, Leonard L. Comeau. Hyperammonemic coma caused by *Providenciarettgeri* infection in a child with prune belly syndrome. *Pediatric Critical Care Medicine*. 2001;2:178-180.