

BLOOD STREAM INFECTIONS IN AL-NASSYRIA CITY⁺

.Yahia A. Abass^{*}

Abstract

Blood for culture was collected from two hundred patients admitted to the hospitals at Al-Nassyria city . 96(48%) were positive for bacteremia . Hospital acquired infections were recorded in 64(67%) of the cases . 3% of these were anaerobic bacteria . The isolated pathogens appeared high sensitive to the antibiotics : ciprofloxacin , vancomycin , gentamycin , cefotaxim .

المستخلص

جمعت عينات دم من (٢٠٠) مريض من المرضى الراقدين في مستشفيات مدينة الناصرية وتمت زراعتها . أظهرت النتائج ان ٩٦(٤٨%) من العينات كانت موجبة لأصابتها بتجرثم الدم . ظهر ان ٦٤(٦٧%) من الإصابات ناتجة من عدوى المستشفيات، وكانت ٣% من مسببات تجرثم الدم بكتريا لاهوائية . أظهرت الجراثيم المعزولة حساسية عالية للمضادات الحيوية Ciprofloxacin , Vancomycin , Gentamycin and Cifotaxim

Introduction

Information regarding the evaluation incidence, etiology and prognosis of blood stream infections suggests an increasing trend in the incidence of significant bacteremia as well as in the etiology of their dreaded infections in recent years. This is probably related to changes in the underlying diseases of susceptible populations, to more aggressive and invasive medical practice and to the presence of more virulent and difficult to treat micro-organisms [1]. The causative agents of blood stream infections vary in different areas of the world and among different institution. Wilson and Polin [2] mention that β -haemolytic streptococci and Gram – ve enteric bacteria are the most common etiologic agents. Cockerill *et al.*, [3] reported that Gram +ve organisms represent more than 50% of all isolates of blood culture in different institutions which confirm the shift in the etiologic spectrum of bacteremia and current sophisticated therapeutic modalities, blood stream infections still carry high morbidity and mortality among hospitalized patients especially those with compromised host defenses [4].

Materials and Methods

Blood for culture was obtained aseptically from two hundred patients were admitted to general hospital and pediatric and gynecology hospital at Al-Nassyria city. Five milliliters of blood was inoculated in two bottles containing 50 ml of brain heart infusion broth(Oxoid) (2 ml in 25 ml for neonates), one for aerobic and the other for anaerobic culture. The cultured bottles were incubated for 24 hr. at 37°C up to 7 days or until designated positive. Subculture

⁺Received on 2002/2/1 , Accepted on 2002/9/21

^{*}Asis. Prof / Community Health Dept.,Nassyria Tech. Institute

on blood agar and chocolate agar from cultured bottles was done every day. Isolated bacteria was identified according to Diagnostic Microbiology [5] .

Types of infection whether hospital or community acquired was determined : community acquired is when positive blood culture obtained at or within 48 hr. of admission. While hospital acquired defined as positive blood culture more than 48 hr. after admission [1]. Clinical sepsis (Blood stream infection without positive blood culture) was not included.

The susceptibility of strains to 12 antibiotics (Gentamycin, Ampicillin, Tetracycline, Trimethoprim, Amoxicillin, Penicillin, Metronidazole, Vancomycin, Chloramphenicol, Cephalothin, Cefotaxim and Ciprofloxacin) were performed by disc diffusion method [6].

Results

Out of a total of 200 blood sample, 96(48%) were positive for bacteremia, 58(60%) were males and 38(40%) were females. The majority of infections occurred in medical unit: 43(45%) followed by the pediatric unit 25(26%), surgical unit 18(19%) and gynecology 10 (10%).

Hospital acquired infection was recorded more than that from the community 64(67%) versus 32(33%).

Staphylococcus aureus were the predominant pathogen isolated from patients (35%) followed by *Escherichia coli* (21%) , *Klebsiella* spp. (14%) , β -haemolytic streptococci (13%), *Salmonella* spp. (9%) and *Proteus* (6%), Table 1.

From anaerobic culture 3(3%) were positive for bacteremia . *Bacteroides fragilis* (2 isolates) and *Clostridium novyi* A (1 isolate).

The isolates appeared high sensitive to the antibiotics : ciprofloxacin (92%), vancomycin (91.6%) , gentamycin (90.6%) and cefotaxim (85.4%). All the anaerobic isolates were susceptible to metronidazole, chloramphenicol and tetracycline .

Multi-drug resistance (resistance to 3 or more antibiotics) was observed in 65% of the total isolates (Table 2).

Table 1. Frequency and percentages of bacteria isolated from patients.

Pathogen	No.	Percentage
<i>Staphylococcus aureus</i>	34	35
<i>Escherichia coli</i>	20	21
<i>Klebsiella</i> spp.	13	14
<i>B-haemolytic streptococci</i>	12	13
<i>Salmonella</i> spp.	9	9
<i>Proteus</i> spp.	5	5
<i>Bacteroides fragilis</i>	2	2
<i>Clostridium novyi</i> A	1	1
	96	100%

Table 2. Antibiotic susceptibility pattern of the isolated bacteria

Isolates	No	GN No %	AMP No %	TE No %	W No %	AML No %	P No %	MTZ No %	VA No %	CH No %	KF No %	CTX No %	CP No %
<i>Staph. aureus</i>	34	34 (100)	28 (82)	0	0	30 (88)	0	0	34 (100)	4 (13)	15 (47)	30 (88)	34 (100)
B-haemolytic streptococci	12	12 (100)	12 (100)	10 (83)	4 (33)	6 (50)	12 (100)	0	12 (100)	11 (92)	12 (100)	12 (100)	12 (100)
<i>E. coli</i>	20	17 (85)	8 (40)	7 (35)	6 (30)	16 (80)	-	0	18 (90)	10 (50)	6 (30)	15 (75)	14 (70)
<i>Klebsiella spp.</i>	13	11 (85)	10 (77)	9 (69)	6 (46)	9 (69)	-	0	13 (100)	11 (85)	7 (54)	12 (92)	13 (100)
<i>Salmonella spp.</i>	8	6 (75)	3 (38)	4 (50)	3 (37)	4 (50)	-	0	6 (75)	6 (75)	5 (63)	5 (63)	8 (100)
<i>Proteus spp.</i>	6	5 (83)	2 (33)	1 (17)	2 (33)	4 (67)	-	0	5 (83)	4 (67)	2 (33)	5 (83)	5 (83)
<i>Bacteroides fragilis</i>	2	1 (50)	0	2 (100)	0	1 (50)	-	2 (100)	0	2 (100)	1 (50)	2 (100)	2 (100)
<i>Clostridium novi A</i>	1	0	0	1 (100)	0	0	1 (100)	1 (100)	0	1 (100)	0	1 (100)	1 (100)
	96	86 (89.6)	63 (65.6)	34 (35.4)	21 (21.8)	70 (72.9)	13 (13.5)	3 (36)	88 (91.6)	49 (51)	48 (50)	82 (85.4)	89 (92.7)

GN=Gentamycin, AMP=Ampicillin, Te=Tetracycline, W =Trimethoprim, AML=Amoxicillin, P=Penicillin, MTZ=Metronidazole, VA=Vancomycin, CH=Chloramphenicol, KF=Cephalothin, CTX=Cefotaxim, CP=Ciprofloxacin

Discussion

The occurrence of blood stream infections had increased among hospitalized patients over the last decade [7]. In recent years Gram positive bacteria have emerged as important pathogens both in the community and hospitals [8]. In the present study, hospital acquired bacteremia was more than community-acquired infections and infections due to *Staph. aureus* were more than other infections caused by other pathogens. This is in accordance with what has been reported by other investigators [1 , 9]. Bacteremia occurred more in the medical unit than in the other units. The severity of the underlying conditions of many patients admitted to the intensive care units and the need for multiple intravascular and other devices make such patients more vulnerable to blood stream infections [1], and patients with Salmonellosis were admitted in medical unit.

A study in U.K revealed bacteremia to be the most common infections following respiratory tract and surgical wounds infections [10]. Our study as in other reports [1, 11] showed that the presence of intravascular catheter was strongly associated with blood stream infections.

Isolation of obligate anaerobes from blood may signal presence of a serious underlying condition. The incidence of anaerobic bacteremias in the presence study was 3%. Other studies show an incidence ranging between 0.16% and 17.3% [12].

This study appeared that ciprofloxacin was the more effective antibiotics (92%) against all the isolated pathogens, followed by vancomycin (91.6%), gentamycin(89.6%) and cefotaxim(85.4%). Shnawa [4] found that vancomycin, ampicillin and gentamycin was the best choice for treatment of bacteremia. Baqir et al., [13], mention that amikacin was the most effective drug against Gram negative bacilli and carbincillin against Gram positive pathogens.

ACKNOWLEDGEMENT

The author is grateful to all the bacteriologists in bacteriology dept. at general hospital and hospital of pediatric& gynecology for their advice and helpful through the study.

References

1. Akbar D.H., Mushtaq M.A., El-Tahawi A.T. and Bahnacy A.A."Staphylococcus aureus bacteremia" *Saudi Med. J.*,Vol.21, pp. 171-174, 2000.
2. Wilson M.C. and Polin R.A. "Neonatal septicemia " *Pediat. Clin. North Am.*, Vol. 30 ,pp.243-258, 1983 .
3. Cockerill F.R., Hughes J.G. , Vetter E.A., Mulker R.A., Weaver A.L. and Itstrup D.M. "Analysis of 281, 797 consecutive blood culture performed over an eight-year period: trend in micro-organism isolated and the value of anaerobic culture of blood" *Clin. Infect. Dis.*, Vol. 24, pp. 403-418.
4. Shnawa K.H. " *Antibiogram profile of neonatal septicemia pathogens*" PDCLI thesis, College of Medicine, University of Tikrit, 1999 .
5. Baron E.J. and Finegold S.M." *Bailey and Scotts Diagnostic Microbiology*" 8th ed., C.V. Mosby Company, 1994.
6. Al-Zaidi Y.A. "Antibiotic resistance among different species of group-D streptococci" *Tech. Res.*, Vol. 10, pp. 22-30.

7. Emori T.G. and Gaynes R.P. "An overview of nosocomial infections, including the role of the microbiology laboratory" *Clin. Microbiol. Rev.*, Vol. 6, pp. 428-442 ,1993.
8. Howe R.A. , Brown N.M. and Spencer R.C. "The new threat of Gram – positive pathogens :re-emergence of things past" *Clin. Pathol.*, Vol. 49, pp. 444-449, 1996.
9. Roveaux O., Jans B., Suetens C. and Carsaun H. "Epidemiology of blood stream infections in Belgium 1992-1996 " *Clin. Microbiol. Infect. Dis.*, Vol. 17, pp. 695-700, 1998.
10. Spencer R.C. "Bacteremia caused by multi-resistant Gram-positive microorganisms" *Clin. Microbiol. And Infec.*, Vol.2, pp. 2517-2528, 1999.
11. Bergone-Berezin E. and Towner K.J. " Acinetobacter spp. as nosocomial pathogens :microbiological, clinical and epidemiological features" *Clin. Microbiol.*, Vol. 9, pp. 148-165, 1996.
12. Pottumarthy S. and Morris A.J. " Assessment of yield of anaerobic blood culture " *Pathol.*, Vol.29, pp. 415-417, 1997.
13. Baqir H.I., Saadallah and Al-Qishtani S.A. " Septicemia in children hospital" *Fec. Med.*, Vol. 32, pp. 271-272 , 1990 .