Soft Tissue Infections associated Bacteria

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Abstract

Objectives: This work aimed to isolate and identify microorganisms from different clinical conditions; it is also to do anti microbial sensitivity test to recommend the most effective antimicrobial agents.

Methodology: Each specimen collected from different sites of the body was subjected to well known microbiological methods for isolation and identification of certain microorganisms.All isolates were tested for sensitivity or resistance to the commonly used drugs employing Kirby-Bauer technique [(1)].

Results: Out of the total samples studied (168) it was possible to isolate and identify 124 microorganisms from which Gram-Positive bacteria represented 50 isolates (62%) while Gram-negative bacteria represented 74 isolates (91.76%).
From the Gram-positive bacteria it has been found that S. aureurs represented 25 (20.16%) isolates followed by' S. epidermidis 16 (12.90%) isolates.
P. aeruginosa which is Gram-negative bacteria ranks the highest among all isolates representing 30 isolates (24.19%) followed by K. pneumonia 15 (12.90%) and proteus spp 14 (11.29%) respectively.
No site of specimens was free from serratia although it is with low percentage ranging from (1.48% - 0.74%)
Antimicrobial sensitivity test revealed that S. pneumonia is highly sensitive to
Clindamycin 90% and to Amoxicillin 90% respectively and less sensitive to vancomycin 60%.
K. pneumonia revealed resistance to chloramphenicol 2% and to each of the drugs lincomycin, cloxacillin and erythromycin 40% respectively. P. aeruginosa showed high resistance to most of the drugs used In this study ranged between 10-52%.It reveals sensitivity to cefatriaxon 90% and less sensitive to ceftazidine 80% Serratia marcessens showed good sensitivity to all antimicrobial used in this study except co-trimoxazole to which it is resistant.

Conclusion: Grams- negative bacteria are the predominant from which P. aeroginosa rank the highest among all isolates. No sit of specimens was free from serratia mercessens. S. pneumonia is highly sensitive to clindomycine (90%) P. aeroginosa showed high resistaice to most of the drugs used in this study.

Key words: Bacteria, soft tissue, antibiotic

Introduction

Escherichia coil, Klebsiellea spp, Enterobacter spp, pseudomonas spp, citrabacter spp and serratia spp are the risk factors of nosocomial infection [1].

Enterobacter and serratia infections are clearly related to hospitalization especially to invasive procedures such as intravenous catheterization and urinary tract manipulation. In addition, outbreaks of serratia pneumonia have been associated with

Contamination of the water in respiratory therapy devices [2]. Serratia marcessense causes, pneumonia, bacteremia, urinary tract infections and spontaneous necrotizing mycosis due to resistant strains [3, 4]. Serratia marcessens was isolated from wound swabs, sputum and blood specimens and commonly isolated in patients with chronic osteomyelitis [5, 6].

Special adhesive properties of intestinal colonization by Klebsiella, Enterobacter and Serratia (KES) associated with resistance to antimicrobial agents could count for the Pathogencity of certain nosocomial strains [7].

Patients & Methods

Patients:-

One hundred and sixty eight patients attending Al-Yarmouk teaching hospital for different clinical conditions were the subject of this study. Which is done during the period February 2003 to March 2005 in which the samples were chosen according to the availability of the clinical conditions whether from in or outpatients؟

Methods:

Specimen Collection:

Ear swabs from suspected otitis media collected carefully. Skin swabs from patients suffering from acne and from. Contaminated surgical wounds from different parts of the body. Blood samples from patients suspected of suffering from bacteraemia cases which were collected aseptically all the above specimens were collected for the purpose of isolation and identification of certain microorganisms.

Specimens processing:

Routine established microbiological methods were followed to thoroughly diagnose the isolates. These include direct smear stained by

Grams- stain followed by culturing on suitable media whether for Grams Positive or Grams-negative bacteria. Each isolate was tested by biochemical reactions.

Antimicrobial susceptibility test:

Well known technique [8] is applied for detection of susceptibility of the isolates for the commonly used antimicrobial agents. The results as sensitive or resistant were compared to a standard zone of growth inhibition. Table 1.

Table I ---- Interpretation of zone inhibition by using Kirby & Bauer method (disc diffusion method.)

Antimicrobial agent	Code	Disc potency Mcg/Disc	Diameter of zone inhibition		
			Resistant	Intermediate	Sensitive
Ampicillin	AM	10	≤11	12 -13	≥20
Cefotaxime	CTX	30	≤ 14	15 – 22	≥23
Cephalexin	KF	30	≤ 14	15 – 17	≥18
Chloramphenicol	C	30	≤ 12	13 – 17	≥18
Ciprofloxacin	CIP	10	≤ 15	16 – 20	≥21
Clindamycin	CN	2	≤ 12	13 – 17	≥18
Tobramycin	TM	10	≤ 13	13 – 14	≥15
Erythromycin	E	15	≤ 13	14 – 17	≥18
Ampiclox	AMP	30	≤ 14	15 – 16	≥17
Gentamycin	GN	10	≤ 12	13 – 14	≥15
Nalidixic acid	NAL	30	≤ 13	14 – 18	≥19
Pencillin-G	PG	6	≤ 20	21 – 28	≥29
Rifampicin	RA	5	≤ 16	17 – 19	≥20
Co-Trimoxazole	SXT	25	≤ 18	19 – 23	24 – 32
Amoxicillin	AMX	10	≤ 19	-	≥29
Amikacin	AN	30	≤ 14	15 - 16	≥17

Results & discussion

The result of this study showed that out of 168 patients it was possible to isolate124 different microorganism from different sites.

Table 2 which shows the distribution of the isolates it is seen that the predominant isolate is P. aeruginosa which represented 30 (24.19%) isolates, a result which agreed with those [9] who showed that P. aeroginosa is available in post surgical wound infections.

S. aurous renkes the second in the distribution of the isolate 25 (20.16%). The least in the distribution is S. pneumonia 0.8%

Table 2- The distribution of the isolates among the study groups

Type of bacteria	No. of isolate	%
Gram- positive		
S. aureus	25	2.20%
S. epidermidis	16	12.9%
S. pyogenes	8	6.5%
S .pneumonia	1	0.8%
Gram- negative		
P. aeroginosa	30	24.2%
Proteus spp	14	11.3%
E. coli	8	6.5%
K. pneumonia	15	12.1%
S. marcessens	7	5.7%
Total	124	

From table 3 the most frequently encountered isolate is P. aeruginosa which is 15 isolates from ear swabs followed by S. aureus which is 10 isolates from skin swabs

Result which agreed with those [9] who showed that P. aeruginosa increasingly isolated from otitis media and that S. aureus is frequently isolated from skin lesions. Five isolates of S. aureus from wound, ear and blood respectively.

It is interesting that pus is free from S. aureus while it contains 8 isolate of K. pneumonia.

In reviewing the relevant studies it has been found that K. pneuminia [10] could represent the major isolates among Gram's negative bacteria from clinical isolates.

In our study K. pneumonia is less frequently isolated as compared with P. aeroginosa especially from ear swabs. S. marcessens the recently emerged pathogen, although it is found in low frequency but it is seen from table 2 that there is no specimen is free from this pathogen a result which agreed with those who (11) showed that nosocomial infection due to S. marcessens could lead to an outbreak and it is widely distributed in soft tissue infections [11, 12]

Antimicrobial sensitivity tests showed that P. aeroginosa (table 4) revealed high resistance to most of the antimicrobial drugs used in this study like CO- trimoxazole, cephotaxime and gentamycine (10%, 20%, 10%) respectively concerning the pattern of sensitivity P. aeruginosa showed high sensitivity to Cefatriaxon and Ceftazidine 90%and 80% respectively while it reveals moderate sensitivity to the drug. Tobramycin 52% and to Amikacin (79%).These results are almost in agreement with those who showed that variety of drugs ,K. Pneumonia revealed high sensitivity to most of the drugs except two for which K. pneumonia are highly resistant and those are Co-trimoxazole 10% and cefatriaxon 30% respectively[13]. It is also seen from table 4 that E. coli is resistant to cefatriaxon 20% and to Co-triamoxazol 40%.

Proteus species showed sensitivity to chloramphincol 85% and to ciprofloxacin 85% while it showed high resistance to the drugs tobramycin 20%. Amikacin 20% o to Co-trimoxazole 10%14.15.

Table 3- Distribution of isolate according to site of specimens taken

Sites of specimens	No. of patient	No. of Isolate	S. aureus	S. epidermidis	S. Pyogene	S. Pneumoia	S. aeruginosa	Proteus SPP	E. coli	K. pneumonia	S. marcessans
Wound	30	22	5	5	1	0	3	1	3	3	1
Skin	32	28	10	5	4	0	5	1	0	1	2
Pus	31	27	0	1	0	0	6	6	4	8	2
Ear	28	36	5	5	1	0	15	6	1	2	1
Blood	37	11	5	0	2	1	1	0	0	1	1

Table 4- The susceptibility of Gram- negative bacteria to antimicrobial agent – in percentage

Type of bacteria	TM	AN	GM	C	CE	CF	CA	CRO	CO
P. aeruginosa	52	79	10	70	20	45	80	90	10
K. pneumonia	70	80	60	90	80	70	75	30	10
S. marccessans									
E coli	50	60	60	50	50	70	70	20	40
Proteus	20	20	40	85	85	75	75	50	10

TM= Tobramycin, AN=Amikacin, GM=Gentamycine, C=chloromphenicol, CE= cephotaxime, CF=ciprofloxacin, CA= ceftazidine, CRO= Cefatriaxon, Co=C0- trimoxazole

Antimicrobial sensitivity test revealed that from the Gram-positive bacteria (table5) S. pneumonia is highly sensitive to Ampicillin and Amoxcillin 90% respectively and less sensitive to vancomycin 60%, moderately sensitive to each of the drugs Lincomiycin, clindamycin and Erytheromycin 40%. While it reveals resistance to chloramphenisol 20%. And tetracycline 10%. This result agreed with others [13 16, 17] who showed that antibiotic abuse is the important factor in creating bacterial resistant to the antimicrobial drugs and that (85%) of S. aureus was penicillin resistant

S. pneumonia on the other hand showed resistance to the drugs Cloxocillin, chloromphinicol, tetracycllin and lincomycin.

Table 5: The susceptibility of Gram positive bacteria to antimicrobial agents

Type of bacteria	L	CL	AM	AMX	C	VA	T	E
S. Aureus	70	50	60	50	60	90	40	60
S. pyogenes	90	50	50	40	90	80	10	50
S. Pneumonia	40	40	90	90	20	60	10	40

L=Lincomycin, CL=Clindomycine, Amx= Amoxicillin, VA=vancomycin, T=tetracycline,

E=Erythromycin

AM=Ampicillin, C=Chloramphenicol

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