International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2019): 7.583

A Study of Microbial Isolates of Pyoderma in a Tertiary Care Hospital

Dr. Nagasrilatha Bathala[1], Dr. Sasidhar Majeti[2]

[1]Associate Professor of Microbiology, Government Medical College, Kadapa, Andhra Pradesh, India
[2]Professor & HOD Of Microbiology Government Medical College, Kadapa, Andhra Pradesh, India

Abstract: ***Back ground: In India, skin infections constitute a large percentage of skin diseases among which pyodermas take a very prominent place. Pyoderma can either manifest as primary or secondary pyoderma. Most cases of pyoderma do not respond to the antibiotics though they were previously very effective for such cases. This emergence of antibiotic resistance poses a serious threat to public health and also poses a big problem to the clinicians. In order to reduce the problem of antibiotic resistance, it is important to survey and screen all clinical isolates for resistance. Aims and objectives: 1. To isolate and identify the organisms from clinical samples of patients with pyoderma. 2. To study the antibiotic susceptibility pattern of isolates. Material and Methods: The pus samples from pyoderma lesions were collected by using sterile swabs. The swabs were inoculated on McConkey Agar and Blood Agar and were incubated over night aerobically at 370 C. If growth was obtained the isolated strain was identified as per standard operative procedures. All the isolated bacterial strains were subjected to antibiotic sensitivity test using Kirby-Bauer disc diffusion method. Results: Growth was obtained in 104 (88.13 %) cases Majority were Bullous impetigo cases (38.13 %). Coagulase positive Staphylococcus was isolated in 42.3 % of total cases followed by Coagulase negative Staphylococcus (24.57 %). Candida was isolated in 3.38 % cases and mixed growth was obtained with Cons and Candida in 3 cases (2.5 %). All the isolated bacterial stains were susceptible to Amoxyclav except E.coli (80 %). Candida isolates were more in diabetic individuals. Conclusions: 1. Impetigo was the most common clinical presentation of pyoderma cases. 2. Staphylococci was the predominate organism causing pyoderma. 3. Candida was also an etilogical agent of pyoderma. 4. All the isolated bacterial strains were resistant to Penicillin and susceptible to amoxicillin and clavulanic acid.***

Keywords: Pyoderma, Staphylococci, Candida, antibiotic susceptibility

1. Introduction

Skin and soft-tissue infections are the most common infections and serves as a major cause of serious local and systemic complications. In India, skin infections constitute a large percentage of skin diseases among which pyodermas take a very prominent place. Factors like malnutrition, overcrowding and poor hygiene have been stated to be responsible for its higher incidence[1]. Pyoderma can either manifest as primary or secondary pyoderma. Primary pyoderma has a characteristic morphology caused by a single organism, and arises in normal skin. Primary are most frequently caused by Coagulase positive Staphylococci or β–hemolytic Streptococci. Secondary pyoderma occurs as a superimposed condition in diseases like eczema, ulcers, scabies, pediculosis etc. Staphylococci and streptococci can also cause secondary pyoderma along with Gram-negative microorganisms like Proteus, Klebisella, Pseudomonas aeruginosa and Escherichia coli. Most cases of pyoderma do not respond to the antibiotics though they were previously very effective for such cases[2].

This emergence of antibiotic resistance poses a serious threat to public health[3,4] and also poses a big problem to the clinicians[2]. As it is not always possible to do pus culture and antibiogram in all Pyoderma cases, there is a need of protocol to help the treating clinician (continuously monitoring the changing patterns of antibiotic sensitivity). In order to reduce the problem of antibiotic resistance, it is important to survey and screen all clinical isolates for resistance[5]. The antibiotic sensitivity pattern differs from region to region and in the same region they differ with progress of time[6]. Hence the present study was designed to know the causative organisms and their antibiotic susceptibility patterns of pyoderma cases in our area.

Aims and objectives:

1) To isolate and identify the organisms from clinical samples of patients with pyoderma.
2) To study the antibiotic susceptibility pattern of isolates.

2. Materials and methods

The clinical samples were collected from the patients attending Dermatology outpatient department, Government General Hospital, Kadapa, Andhra Pradesh from January 2019 to December 2019. The pus samples from pyoderma lesions were collected by using sterile swabs. The collected samples were transported to the Microbiology laboratory, under aseptic conditions immediately. The swabs were inoculated on McConkey Agar and Blood Agar and were incubated over night aerobically at 37^0 C. All the inoculated plates were observed for growth. If growth was obtained the isolated strain was identified (cultural, morphological and biochemical characters) as per standard operative procedures. All the isolated bacterial strains were subjected to antibiotic sensitivity test using Kirby-Bauer disc diffusion method. All the procedures were done as per standard operative procedures[7].

3. Results

Among the total cases (118) males were 76(64.4%) and females were 42 (35.6%).

High incidence was observed in the age group less than 10 years (17.4%). Growth was obtained in 104 (88.13%) cases and no growth was observed in 14 (11.87%) cases. Majority were Bullous impetigo cases (38.13%) followed by folliculitis, furuncle. Coagulase positive Staphylococcus was

isolated in 42.3% of total cases followed by Coagulase negative Staphylococcus (24.57%), Beta heamolytic Streptococci (7.6%), Escherechia coli (4.2%), Klebsiella (3.38%). Candida was isolated in 3.38% cases and mixed growth was obtained with Cons and Candida in 3 cases (2.5%) as shown in Table 1.

Table 1: Distribution of isolated organisms in Pyoderma cases

CLINICAL DIAGNOSIS	CPS	CNS	BHS	E.COLI	KLEBSIELLA	CANDIDA	CONS & CANDIDA	NO GROWTH	TOTAL
BULLOUS IMPETIGO	21	12	4	-	-	-	-	8	45
FOLLICUTITIS	18	3	-	-	-	-	-	-	21
FURUNCLE	4	3	1	-	-	-	-	2	10
ECTHYMA	2	1	2	-	-	-	-	1	6
INFECTED SCABIES	4	4	2	2	2	2	1	2	19
INFECTED ULCER	1	6		3	2	2	2	1	17
TOTAL	50	29	9	5	4	4	3	14	118

Table 2: Antibiotic Sensitivity of Isolated Bacteria.

ANTIBACTERIAL AGENT	CPS(50)	CNS(29)	BHS(9)	E COLI(5)	KLEB(4)
PENCILLIN	0	0	0	0	0
CEFPODAXIME	48(96%)	28(96%)	6(66.6%)	2(40%)	3(75%)
AZITHROMYCIN	28(56%)	21(72.4%)	9(100%)	0	0
CLINDAMYCIN	34(68%)	18(62%)	9(100%)	1(20%)	0
COTRIMAXAZOLE	23 (46%)	15(51.7%)	8(88.8%)	4(80%)	4(100%)
AMOXYCLAV	50 (100%)	29(100%)	9(100%)	4(80%)	4(100%)
NALIDIXIC ACID	-			4(80%)	2(50%)
CIPROFLOXACIN	28 (56%)	18(62%)	9(100%)	5(100%)	4(100%)
OXACILLIN	2(4%)	0	-	-	-
VANCOMYCIN	46(92%)	29(100%)	-	-	-

All the isolated bacterial strains were totally resistant to Pencillin. All the isolated bacterial stains were susceptible to Amoxyclav except E.coli (80%). Majority of isolated CPS were sensitive to cefpodoxime (96%), vancomycin (92%) followed by clindamycin (68%). Only 4% of isolated CPS were sensitive to Oxacillin. All the isolated Cons were resistant to Oxacillin and were sensitive to vancomycin. Among the isolated gram positive cocci BHS showed less resistant to antibacterial agents. Gram negative bacilli- E.coli and Klebsiella were susceptible to ciprofloxacin (100%). Cefpodoxime susceptibility was 40% for E.coli and 75% for Klebsiella. Isolated Candida strains were not subjected for anti fungal susceptibility.

Table 3: Candida isolates in co morbid Diabetes

	Candida	Candida + CoNS	Total
Diabetic	4	2	6
Non diabetic	0	1	1
Total	4	3	7

Candida isolates were more in diabetic individuals either as single (4/4) or with CoNS (2/3).

4. Discussion

Knowledge of the causative pathogens of pyodermas facilitates the planning and provision of health care needs[1]. Among the pyoderma cases taken for the present study, 38.13%% were bullous impetigo cases which was near to Kumari etal (41%)[8] Parveen Thind et al (42%) [9] and, followed by folliculitis 17% and furuncle 11%.Pyoderma was found to be of common occurrence among the males of all age groups. In the present study high incidence was observed among males of 0-10 age group with 65%. Similar findings were reported by Shashi Gandhi etal[10], 61.2% Varsha et al,(2014) 54%[11]. Among the organisms isolated from pyoderma, Coagulase positive Staphylococci was the predominated organism (42.3%) and it was almost similar with observations by K V Ramana et al, (2008)[12]; Y Bhavani et al., (2011)[13]; Paudel U et al, (2013)[14] and Kumari et al[8]. Coagulase negative staphylococcus was isolated singly in 24.57% of cases and with Candida sps in 2.5% of cases, which indicated that infections by commensal organisms should be considered as majority of isolated strains were not only from secondary pyoderma cases but also from primary pyoderma cases. Presence of Candida sps as single etiological agent and along with Cons in present study was because of co existing diabetic condition as this is an important risk factor to precipitate fungal infections. It was also observed that candida sps were reported less as an etiological agent of pyoderma in available studies. Beta hemolytic Streptococci were next common isolated organism from cases of impetigo. These organisms should be considered as important pathogens in order to prevent further complications like acute glomerulonephritis with this organism if left untreated.

Gram negative organisms like Escherichia coli and Klebsiella were also isolated in our present study in 4.2% and 3.38%. respectively and it was 6%and 4% in a study by janardhan etal [4] and 4% of Escherichia coli in a study by amreeth singh et al[1]. Culture was sterile in 11.86% of cases and it was 10% , 15%, 16.3% and 16% in studies by Rani etal[2], Kumari et al[8], Rahul et al [15]and and Bhatt et al[16]respectively. Whereas in a study by Surekha et al[17] it was very less i.e. 4%.

Antimicrobial resistance is an unavoidable consequence of the selective pressure of antibiotic exposure. Minimizing the antibiotic pressure is essential to control the emergence of resistant strains in the hospital as well as in the community.[18] In our present study all the isolated bacterial strains were resistant to pencillin. High percent of resistance with penicillin was also observed in a study by Kulakarni et al

(90.53%) [19]. All bacterial strains isolated (100%) in present study were susceptible to amoxicillin- clavulanic acid except Esch. coli (80%). Staphylococcal strains showed high resistance towards antibacterials when compare to other strains in our study. Only 4% of CPS were susceptible to Oxacillin and no CoNS strain was susceptible to Oxacillin; which represents high existence of methicillin resistance Staphylococcal strains in community as well. And it was also observed that 92% of CPS and 100% of CoNS were susceptible to vancomycin and it was almost near to studies by Rani et al (100%)[2], amreet et al (94.66%)[1], Kumari et al (95.4%)[8], Bhatt et al (91%)[16], Surekha et al[17] (97.11%), Rahul et al[15](100%), but it was only 86.1% in Anurag et al[3].

In our study sensitivity of all beta haemolytic Streptococci with antimicrobials was observed except towards Penicillin. But in a study by Kumari et al[8] all BHS were susceptible to Penicillin. Usually Gram negative bacilli exhibit high resistance but in present study it was quiet different that majority of the isolated Gram negative strains were susceptible; which might be due to isolation GNB in less percentile of the total organisms isolated.

5. Conclusions

1) Impetigo was the most common clinical presentation of pyoderma cases.
2) Staphylococci was the predominate organism causing pyoderma.
3) Candida was also an etilogical agent of pyoderma.
4) All the isolated bacterial strains were resistant to Penicillin and susceptible to amoxicillin and clavulanic acid.

References

[1] Amarjeet Singh et al. Bacteriological study and antibiotic sensitivity patterns in cases of pyoderma International Medical Journal August 2014; 1(8): 357-363.
[2] Rani SR, Jayalekha B, Sreekumary PK. Bacteriological profile of pyoderma in a tertiary care centre in Kerala, India. Int J Res Dermatol 2016;2:1-11.
[3] Dr Deep Anurag et al Bacterial Study of Primary Pyoderma in a Tertiary Care Hospital in Eastern India IOSR Journal of Dental and Medical Sciences (Volume 15, Issue 3 Ver. IX (Mar. 2016), PP 76-79.
[4] Janardhan. B et al Clinico-Microbiological Study Of Pyodermas; International Journal of Recent Scientific Research Vol. 6, Issue, 5, pp.3820-3824, May, 201.
[5] Animesh Saxena, Krishnendra Varma, Yash Triwedi. "A Clinico-Microbiological Study of Pyoderma with Special Reference to MRSA". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 31, April 16; Page: 5272-5276, DOI: 10.14260/jemds/2015/772
[6] Purnachandra Badabagni et al. Clinico-etiological study of pyodermas in a tertiary care hospital Indian Journal of Clinical and Experimental Dermatology, April-June 2016;2(2):53-57
[7] Mackie and McCartneyPractical MedicalMicrobiology; 14th edition;chapter7 &8- Tests for identification of Bacteria and Laboratory control for Antimicrobial Therapy; pages131- 178
[8] G.Ratna Kumari N.Sujatha P.Balamurali Krishna Anila S.Nayar; A Study of Bacteriological Isolates of Pyoderma and Its Carrier Sites; INDIAN JOURNAL OF APPLIED RESEARCH; Volume : 5 | Issue : 11 | November 2015 | ISSN - 2249-555X
[9] Parveen Thind, S Krishna Prakash, Anupriya Wadhwa, VK Garg, Binod Pati Bacteriological profile of community acquired pyodermas with special referenceto methicillin resistant Staphylococcus aureus Indian J Dermatol Venereol Leprol 2010; 76:572-4
[10] Shashi Gandhi, A K Ojha, K P Ranjan and Neelima Clinical and Bacteriological Aspects of Pyoderma;North American J of Medical Sciences; Oct 2012 vol:4 issue:10
[11] Varsha T.Kalshetti, V.M.Bhate, Neha Haswani, and S.T.Bothikar Staphylococcus aureus: A Major Causative agent of Community Acquired pyoderma International Journal of Current Microbiology and Applied Sciences volume 3 no:9 (2014) pp.94-97
[12] K. V Ramana, S. K. Mohanty, Arun Kumar In-vitro activity of current antimicrobial agents against isolates of pyoderma Indian J Dermatol Venereol and Leprol Aug 2008; vol:74 issue: 4.
[13] Bhawani Y, Ramani TV, Sudhakar V A bacteriological study of 100 cases of superficial pustular folliculitis with special reference to Staphylococci from lesions and carrier sites; Biology and Medicine, 3 (4): 07-12, 2011
[14] Paudel U, Parajuli S, Pokhrel D.B Clinico-bacteriological profile and antibiotic sensitivity pattern in pyoderma:A Hospital Based study; NJDVL; Vol.11(1) 2013pp.49-58
[15] Patil R, Baveja S, Nataraj G, Khopkar U. Prevalence of methicillin-resistant Staphylococcus aureus(MRSA) in community-acquired primary pyoderma. Indian J Dermatol Venereol Leprol 2006;72:126-8.
[16] YJ Bhat, I Hassan, S Bashir, A Farhana, P Maroof; Clinico-bacteriological profile of primary pyodermas in Kashmir: a hospital-based study; R Coll Physicians Edinb 2016; 46: 8–13
[17] J. K. Surekha, Syeda Amtul Moqueeth, M. L. Shashirekha, M. Lingamurthy, T. Sunitha. "Bacteriological Study of Pyoderma". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 22, March 16; Page: 3845-3853, DOI: 10.14260/jemds/2015/553
[18] B. Naga Srilatha et al. Coagulase Negative Staphylococci as a Pathogen from Wound Infections in a Tertiary Care Hospital; International Journal of Medical Microbiology and Tropical Diseases, January-March,2016;2(1): 1-4
[19] Vivek Kulkarni, Y.M.Jayaraj*, C.T. Shivannavar, Sagar M. Arali And Ravi M; Clinico-Bacteriological Studies On Pyoderma In Gulbarga Region (Karnataka State) Emphases To Methicillin Resistant Staphylococcus Aureus; Int J Pharm Bio Sci 2014 Jan; 5(1): (B) 616 - 624