

Clinico- Bacteriological Study on Pyoderma in Tertiary Hospital in Biratnagar, Nepal: A Descriptive Cross Sectional Study

Anjan Rai¹, Sunita Karki¹, Rajeev Yadav¹, Manish Pradhan¹

¹Department of Dermatology, Nobel Medical College Teaching Hospital, Biratnagar, Nepal

Correspondence

Dr Anjan Rai, MD
Department of Dermatology
Nobel Medical College Teaching Hospital,
Biratnagar, Nepal

Email: dranjanrai@gmail.com

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ABSTRACT

Introduction: Pyoderma is one of the commonest clinical conditions encountered in dermatological practices. In almost all cases pyodermas are easily treatable, although chronicity, recurrence and complications are rarely encountered. This study was conducted to establish the Clinico-bacteriological profile of pyodermas.

Materials and Methods: A Hospital based Prospective descriptive study was conducted at Department of Dermatology, Nobel medical college, Biratnagar from April 2017 to March 2018. Total 108 patients were enrolled in this study. All the data were analyzed using SPSS version 22.

Results: Among 108 patients, 68% were male and 32% were female. Mean age was 19.18 years \pm 19.43 SD. In this study the majority of cases (44.44%) were of impetigo, followed by folliculitis (39.81%), furunculosis (8.33%), ecthyma (6.48%) and bacterial dactylitis (0.92%). Sixty four cases (59%) were gram positive, one case (1%) was gram negative and in 43 (40%) cases no organism was seen. Staphylococcus (S. aureus) was the commonest organism isolated (66%) followed by CONS (Coagulase Negative Staphylococcus Aureus) (3%), Streptococcus pyogenes (S pyogenes) (1%), Pseudomonas aeruginosa (P aeruginosa) (1%), Enterobacter species (1%) and Escherchia coli (E Coli) (1%).

Conclusion: Impetigo was the most common type of pyoderma encountered and Coagulase positive S. aureus was the commonest organism isolated in this study. Timely recognition and prompt bacterial diagnosis is imperative for the effective management and treatment of pyoderma.

Key words: Impetigo, Pyoderma, S. aureus

INTRODUCTION

Pyoderma, a common health problem is characterized by pyogenic infection of the skin and its appendages.^{1,2} Pyodermas is one of the commonest clinical conditions encountered in dermatological practices and are common among preschool and school going children.^{3,4} It may present with a wide spectrum of clinical features and different severity.⁵

Commonly caused by gram positive bacteria and constitute majority of cases but less commonly gram negative organisms may be the cause.⁶ Among the gram positive organisms, *Staphylococcus aureus* is the commonest pathogen followed by *Streptococcus pyogenes*. *Corynebacterium* species, Coagulase negative *Staphylococci*, *Haemophilus influenzae*, *Escherichia coli*, *Pseudomonas* species, *Proteus* species, *Klebsiella* species and anaerobic bacteria are occasionally isolated from skin lesions of pyoderma.^{7,8}

Pyoderma is either primary or secondary. Primary infections include lesions produced by invasion of normal skin by a single species of pathogenic bacteria. Primary pyodermas may manifest as folliculitis, furunculosis, ecthyma, impetigo, cellulitis, erysipelas, erythrasma and paronychia. Secondary infections develop in areas of already damaged skin from any other dermatosis like scabies, eczema, pediculosis, insect bites, burns or wounds.^{9,10}

Proper diagnosis of the disease as in any infection is always based on clinical examination confirmed by clinico-bacteriological examination by bacteriological culture and isolation and identification of the causative organism.

Although easily treatable, pyodermas are known for their chronicity, recurrence, and multitude of complications. Therefore, timely recognition and prompt bacterial diagnosis is imperative for the effective management and treatment of pyoderma.^{11,12}

MATERIALS AND METHODS

A Hospital based descriptive cross sectional study was conducted at Department of Dermatology, Nobel medical college, Biratnagar from April 2017 to March 2018 after ethical clearance from institutional review committee. Total of 108

Medical Journal of Pokhara Academy of Health Sciences Vol. 4 Issue 1 patients were enrolled in this study. A written informed consent was obtained and patients were fully evaluated by taking detail history and physical examination.

The specimen collected before the start of treatment was labeled, numbered and transported to the microbiology laboratory for processing. The specimen was used for microscopic examination after Gram staining to see the arrangement and the number of different types of organisms. Then the specimen was cultured by inoculating into various media and incubated at 37° C for 24 to 48 hours. Organisms grown were then identified on the basis of their colony characteristics and biochemical tests were performed as per the standard protocol.

Data was analyzed with SPSS version 22. Percentages, mean and standard deviation were calculated. Findings were presented as tables, bar diagrams and pie charts.

RESULTS

Table 1: Type of lesion

| TYPE OF LESION | NO. OF PATIENTS | PERCENTAGE |
|----------------------|-----------------|------------|
| IMPETIGO | 48 | 44.44 |
| FOLLICULITIS | 43 | 39.81 |
| ECTHYMA | 7 | 6.48 |
| FURUNCULOSIS | 9 | 8.33 |
| BACTERIAL DACTYLITIS | 1 | 0.92 |
| TOTAL | 108 | 100 |

The majority of cases (44.44%) were of impetigo, followed by folliculitis (39.81%), furunculosis (8.33), ecthyma (6.48%) and bacterial dactylitis (0.92%).

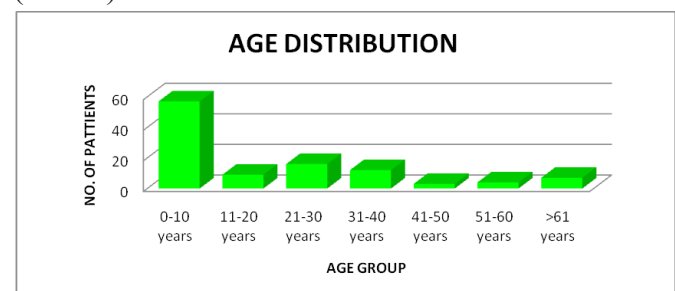


Figure 1: Age distribution

Mean age was 19.18 years \pm 19.43 SD. Maximum number of cases fell in the age group 0-10 yrs (52.77%), followed by 21-30 yrs age group

(14.81%), 31-40 yrs age group (11.11%), 11-20 yrs age group (8.33%), 61 years and above age group (6.48%) and 51-60 yrs age group (3.7%) where as the age group 41-50 yrs had the least number of cases (2.77%) .

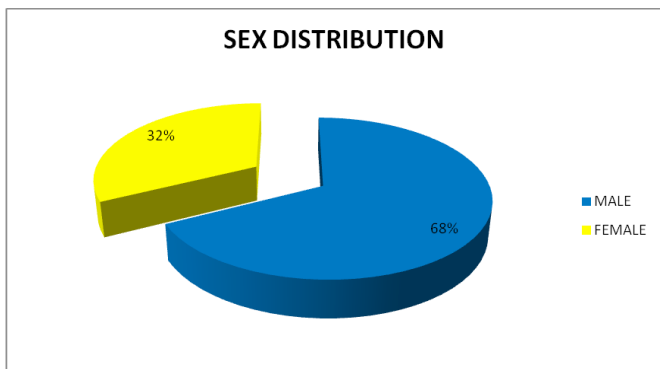


Figure 2: Sex distribution

Primary pyoderma was found to be more predominant in males than in females with male to female ratio of 2.08:1.

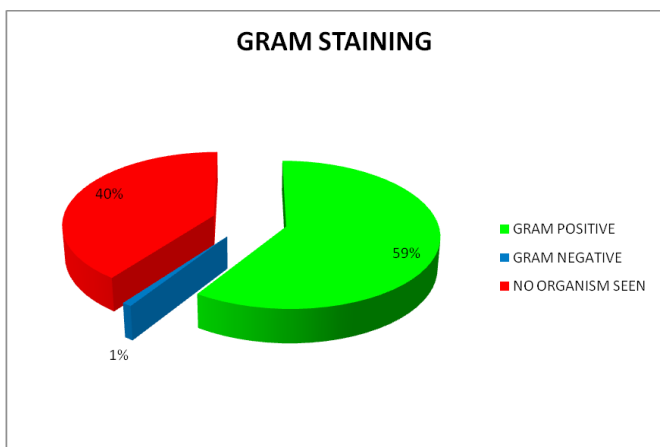


Figure 3: Gram staining

Out of 108 cases of primary pyoderma, where gram staining was done, 64 cases (59%) were gram positive, 1 case (1%) was gram negative and in 43 (40%) cases no organism was seen.

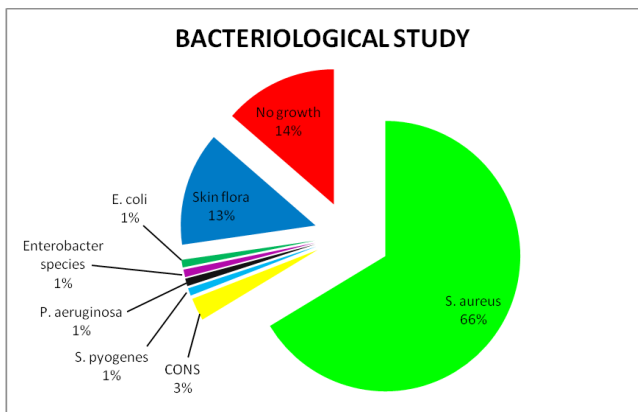


Figure 4: Bacteriological study

In our study we found that S. aureus was the commonest organism isolated (66%). The other organisms isolated were CONS(coagulase negative staph) (3%), S. pyogenes (1%), P. aeruginosa (1%), Enterobacter species (1%) and E. coli (1%). Skin floras were in 13% cases whereas there was no growth in 14% cases.

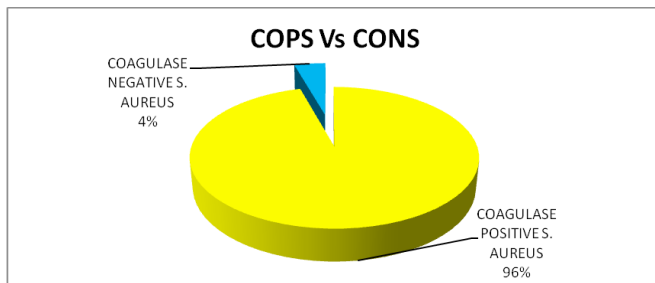


Figure 5: Coagulase test

Out of 73 cases of S. aureus, coagulase test was performed, there were 96% cases of coagulase positive S. aureus and 4% cases of coagulase negative S. aureus.

DISCUSSION

In our study the majority of cases (44.44%) were of impetigo, followed by folliculitis (39.81%), furunculosis (8.33), ecthyma (6.48%) and bacterial dactylitis (0.92%). The finding was consistent with study done by Tushar et al (2012)⁹ in which they accounted impetigo as the commonest pyoderma (26%) and other less common lesion included folliculitis (14%), furuncle/carbuncle (21%), cellulitis (2%) and paronychia(1%).

The highest age of the patient in our study was 90 years, lowest age was 1 yr and mean age was 19.18 yrs ± 19.43 SD while maximum number of cases was seen in the first decade of life (52.8%). In a similar study conducted by Kulkarni et al(2014)¹² the highest incidence was observed in the first decade of life (65.31%).

Present study showed that occurrence of pyoderma was more in males (67.59%) than in females (32.4%). Patil et al(2006)¹³ also found that males (62.8%) outnumbered females (38.2%) in terms of occurrence of pyoderma.

Out of 108 cases of primary pyoderma, 64 cases (59%) were gram positive, 1 case (1%) was gram negative and in 43 (40%) cases no organism was seen. On culture, including skin flora 93 yielded

growth (86%) while there was no growth in 15 cases (14%). Out of 78 cases yielding growth on culture besides skin flora, single organism grew on 76 cases (97%) whereas only 2 cases (3%) yielded two organisms.

In a study done by Paudel et al(1999)¹⁴, single organism was isolated from 88% cases and more than one type of organisms in 5.3% cases while no organism was isolated from 6.7 % cases.

Jyothi et al(1999)¹⁵ in their study showed that infection was due to single organism in 86% and due to mixed organisms in 14% of cases.

In our study we found that *S. aureus* was the commonest organism isolated (66%). The other organisms isolated were CONS (3%), *S. pyogenes* (1%), *P. aeruginosa* (1%), *Enterobacter* species (1%) and *E. coli* (1%).

Tushar et al(2012)⁹ in their study on pyoderma reported that *S. aureus* (78.82%) was the major pathogen involved followed by CONS (12.94%), *E. coli* (4.71%), *Klebsiella* (2.35%) and beta hemolytic *Streptococci* (1.18%).

Ramana et al(2014)¹⁶ isolated *S. aureus* in 52.1% cases, CONS in 19.2% cases, Enterococci in 11.4% cases, *Klebsiella* in 7.8% cases and diphtheroids in 2.8% cases while 6.4% cases were culture negative.

In this study, out of 73 cases of *S. aureus* coagulase test was performed, there were 96% cases of coagulase positive *S. aureus* and 4% cases of coagulase negative *S. aureus*.

In a study conducted by Tambe et al.⁷, result of coagulase test showed that out of 25 sample, 84% of samples were *S. aureus* coagulase positive, while 16% were coagulase negative. Ramana et al.¹⁶ mentioned that out of 36 cases, coagulase positive *Staphylococcus* accounted for 26 (72.22%) cases and coagulase negative *Staphylococcus* accounted for 10 (27.77%) cases.

CONCLUSION

This study showed that Impetigo was the most common type of pyoderma encountered and Coagulase positive *S. aureus* was the commonest organism isolated. Hence we can conclude that for proper diagnosis and treatment of the disease as in any infection is always based on clinical

examination confirmed by clinico-bacteriological profile which is bacteriological culture, isolation and identification of the causative organism.

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