

## Original Research

### Assessment of clinical and bacteriological aspects of pyoderma

Shweta Sharma

Assistant Professor, Department of Microbiology, F H Medical College, Etmadpur, Agra, U.P, India

#### ABSTRACT:

**Background:** Pyoderma is one of the commonest clinical conditions encountered in dermatological practice. The present study was conducted to assess clinical and bacteriological aspects of pyoderma. **Materials & Methods:** 108 patients of pyoderma of both genders were included. Specimen was collected aseptically from the skin lesion using two sterile swabs. The isolates were identified by standard microbiological method. **Results:** Out of 108 patients, males were 65 and females were 43. Primary pyoderma was abscess in 7, cellulitis in 15, diabetic foot ulcer in 12, ecthyma in 20, furuncle in 13, folliculitis in 8 and impetigo in 22. Secondary pyoderma was infected burn in 3, infected kerion in 5, infected wound in 2 and infected dermatitis in 1 case. The difference was significant ( $P < 0.05$ ). Most common pathogens isolated were *S. Aureus* in 66, CONS in 20, *E. species* in 11, *Enterobacter S.* in 5, *Pseudomonas S.* in 4 and *Klebsiella S.* in 2 cases. **Conclusion:** Pyoderma has become a significant cause of skin infections. Most common pathogens isolated were *S. Aureus*, CONS, *E. species*.

**Key words:** Pyoderma, *S. Aureus*, *E. species*

Received: 15-01-2020

Accepted: 19-02-2020

**Corresponding author:** Shweta Sharma, Assistant Professor, Department of Microbiology, F H Medical College, Etmadpur, Agra, U.P, India

**This article may be cited as:** Sharma S. Assessment of clinical and bacteriological aspects of pyoderma. J Adv Med Dent Scie Res 2020;8(3):169-172.

#### INTRODUCTION

Pyoderma is one of the commonest clinical conditions encountered in dermatological practice. It is defined as purulent skin disease and represents infections in the epidermis and dermis or in hair follicle.<sup>1</sup> Humid climate, poverty, malnutrition, overcrowding and poor hygiene have been implicated in the development of pyoderma. Pyoderma are classified into primary (pyoderma occurring without predisposing cause or skin lesion) and secondary pyoderma (pyoderma in which an existing skin lesion becomes secondarily infected).<sup>2</sup> Primary pyoderma comprises of impetigo, folliculitis, furuncle, carbuncle, ecthyma, sycosis barbae and cellulitis. Secondary pyoderma constitutes tropic ulcer, infected scabies and various dermatosis infected with organisms.<sup>3</sup>

Pyoderma is most commonly caused by *Staphylococcus aureus* followed by group A  $\beta$  hemolytic *Streptococci*, *Klebsiella species*, *E. coli*, *Pseudomonas aeruginosa*, *Enterococcus species* and coagulase negative *Staphylococci*.<sup>4</sup> Most common organism usually isolated in pyoderma is *Staphylococcus aureus* which may be either methicillin-sensitive (MSSA) or methicillin-resistant

(MRSA).<sup>5</sup> MRSA is an important health care associated pathogen. Many of these isolates are becoming multidrug resistant. All  $\beta$ -lactams including carbapenams and high-end cephalosporins, piperacillin, tazobactam etc. are ineffective against MRSA. Knowledge of prevalence of MRSA and their current anti-microbial profile becomes necessary in the selection of appropriate empirical treatment of these infections.<sup>6</sup> The present study was conducted to assess clinical and bacteriological aspects of pyoderma.

#### MATERIALS & METHODS

The present study comprised of 108 patients of pyoderma of both genders. All gave their written consent for the participation in the study.

Data such as name, age, gender etc. was recorded. Patients having skin lesions were carefully examined. Specimen was collected aseptically from the skin lesion using two sterile swabs. One swab was used for making a smear for Gram stain and the other swab for inoculation on to the 5% sheep blood agar and MacConkey agar plates. The inoculated plates were incubated aerobically at 37 degree C for 24-48 hours.

The isolates were identified by standard microbiological method. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

**RESULTS**

**Table I Distribution of patients**

| Total- 108 |       |         |
|------------|-------|---------|
| Gender     | Males | Females |
| Number     | 65    | 43      |

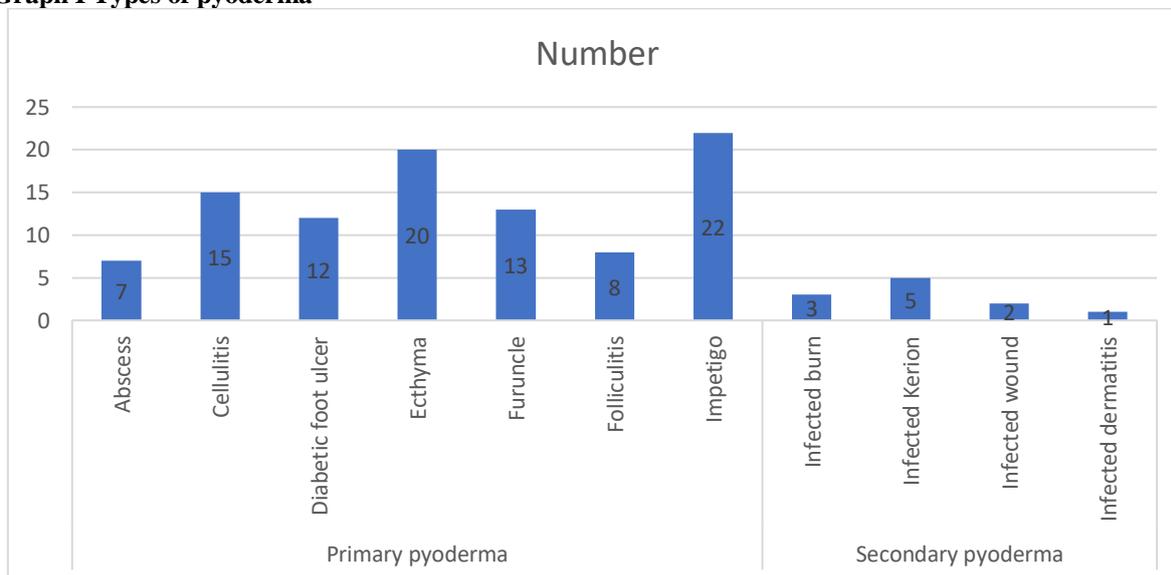
Table I shows that out of 108 patients, males were 65 and females were 43.

**Table II Types of Pyoderma**

| Parameters         | Variables           | Number | P value |
|--------------------|---------------------|--------|---------|
| Primary pyoderma   | Abscess             | 7      | 0.05    |
|                    | Cellulitis          | 15     |         |
|                    | Diabetic foot ulcer | 12     |         |
|                    | Ecthyma             | 20     |         |
|                    | Furuncle            | 13     |         |
|                    | Folliculitis        | 8      |         |
|                    | Impetigo            | 22     |         |
| Secondary pyoderma | Infected burn       | 3      | 0.04    |
|                    | Infected Kerion     | 5      |         |
|                    | Infected wound      | 2      |         |
|                    | Infected dermatitis | 1      |         |

Table II, graph I shows that primary pyoderma was abscess in 7, cellulitis in 15, diabetic foot ulcer in 12, ecthyma in 20, furuncle in 13, folliculitis in 8 and impetigo in 22. Secondary pyoderma was infected burn in 3, infected kerion in 5, infected wound in 2 and infected dermatitis in 1 case. The difference was significant (P< 0.05).

**Graph I Types of pyoderma**



**Table III Clinico- bacteriological profile of pyoderma**

| Types               | S. Aureus | CONS | E. species | Enterobacter S. | Pseudomonas S. | Klebsiella S. |
|---------------------|-----------|------|------------|-----------------|----------------|---------------|
| Abscess             | 3         | 2    | 1          | 1               | 0              | 0             |
| Cellulitis          | 7         | 3    | 2          | 2               | 1              | 0             |
| Diabetic foot ulcer | 4         | 5    | 2          | 1               | 0              | 0             |
| Ecthyma             | 13        | 3    | 1          | 1               | 1              | 1             |
| Furuncle            | 12        | 1    | 0          | 0               | 0              | 0             |
| Folliculitis        | 5         | 2    | 1          | 0               | 0              | 0             |
| Impetigo            | 19        | 1    | 0          | 0               | 1              | 0             |
| Infected burn       | 0         | 1    | 1          | 0               | 1              | 0             |

|                     |    |    |    |   |   |   |
|---------------------|----|----|----|---|---|---|
| Infected Kerion     | 4  | 1  | 1  | 0 | 0 | 0 |
| Infected wound      | 0  | 0  | 2  | 0 | 0 | 0 |
| Infected dermatitis | 0  | 1  | 0  | 0 | 0 | 0 |
| Total               | 66 | 20 | 11 | 5 | 4 | 2 |

Table III shows that most common pathogens isolated were *S. Aureus* in 66, *CONS* in 20, *E. Species* in 11, *Enterobacter S.* in 5, *Pseudomonas S.* in 4 and *Klebsiella S.* in 2 cases.

## DISCUSSION

Primary pyodermas are impetigo, folliculitis, furuncle, carbuncle, ecthyma, erythrasma, and sycosis barbae.<sup>7</sup> Secondary pyodermas constitute tropic ulcer, infected pemphigus, infected contact dermatitis, infected scabies, and various other dermatoses infected with organisms.<sup>8</sup> Various factors like poverty, malnutrition, overcrowding, and poor hygiene have been stated to be responsible for its higher incidence in the lower socio-economic class.<sup>9</sup> Climatic conditions also play a major role. Changing trends are being noted in the etiological aspects of primary pyoderma, and the problem of emergence of drug resistance strains is an even increasing one.<sup>10</sup> The present study was conducted to assess clinical and bacteriological aspects of pyoderma.

We found that out of 108 patients, males were 65 and females were 43. Gandhi et al<sup>11</sup> in their study out of 200 cases of pyoderma, impetigo constituted 106 (53%) cases, superficial folliculitis 78 (39%) cases, furunculosis 13 (6.5%) cases, and carbuncle 3 (1.5%) cases, respectively. The number of cases were maximum in the age group of less than 10 years (48%), followed by the age group of 21–30 years (21%), 11–20 years (17%), 31–40 years (09%), 51–60 years (2.5%), 41–50 years (1.5%), and > 60 years (0.5%). They correlated the relationship between pyoderma and sex. The prevalence rate was higher in male (61.2%) patients compared with females (38.5%). Among the various diseases that were found to be associated with primary pyoderma, scabies was seen to be commonest in 17 (8.5%) cases. The other diseases in descending order of cases were vitiligo 3 (1.5%), diabetes mellitus 2 (1%), dermatophytosis 2 (1%), acne 1 (0.5%), and molluscum contagiosum 1 (0.5%). The study of body-wise distribution of pyoderma revealed that lower extremities were the most often affected site (60%), followed by head (47.5%), upper extremities (21.5%), and trunk (12.5%), respectively. The low socio-economic class was seen to be very commonly affected in 131 (65.5%) cases.

We found that primary pyoderma was abscess in 7, cellulitis in 15, diabetic foot ulcer in 12, ecthyma in 20, furuncle in 13, folliculitis in 8 and impetigo in 22. Secondary pyoderma was infected burn in 3, infected kerion in 5, infected wound in 2 and infected dermatitis in 1 case. Tushar et al<sup>2</sup> in their study thirty patients with purulent skin lesions were included. The isolates were identified by standard microbiological methods. Antibiotic susceptibility testing was done as per CLSI guidelines. Screening for methicillin resistance was done by cefoxitin disc diffusion

method. Primary pyoderma constituted 86.7% and secondary pyoderma 13.3% of cases. Common types of pyoderma seen were impetigo, folliculitis, furuncle and cellulitis (16.7%) each. *S. aureus* was the most common isolate (56.8%) followed by coagulase negative Staphylococci (10.8%). Majority of *S. Aureus* and *Enterococcus* species were found resistant to ciprofloxacin (88% and 100%) respectively. *Enterococcus* species was 100% resistant to aminoglycosides (High level aminoglycoside resistance). *Enterobacter* species, *Citrobacter* species and *Klebsiella* species showed 100% resistance to ciprofloxacin and cephalosporins. Majority of the *Pseudomonas* isolates were resistant to cefotaxime and ceftriaxone (100%). Methicillin resistance was seen in 14.3% of *S. Aureus* and 50% of coagulase negative Staphylococci.

We found that most common pathogens isolated were *S. Aureus* in 66, *CONS* in 20, *E. species* in 11, *Enterobacter S.* in 5, *Pseudomonas S.* in 4 and *Klebsiella S.* in 2 cases. Malhotra et al<sup>13</sup> reported maximum sensitivity to amikacin 77.7% and 52.4% sensitivity to ciprofloxacin. Bhaskaran et al<sup>14</sup> found that superficial folliculitis (25.9%) was the most common pyoderma followed by impetigo (16.36%) and furunculosis (4%). Lawrence et al<sup>15</sup> also observed in their study that children less than 5 years age had the greatest prevalence of lesions.

The limitation the study is small sample size.

## CONCLUSION

Authors found that pyoderma has become a significant cause of skin infections. Most common pathogens isolated were *S. Aureus*, *CONS*, *E. species*.

## REFERENCES

1. Thind P, Prakash SK, Wadhwa A, Garg VK, Pati B. Bacteriological profile of community-acquired pyodermas with special reference to methicillin resistant *Staphylococcus aureus*. *Indian J Dermatol Venereol Leprol* 2010;76:572-4.
2. Nagmoti M J, Patil CS, Metgud SC. A bacterial study of pyoderma in Belgaum. *Indian J Dermatol Venereol Leprol* 1999;65:69-71.
3. Ki V, Rotstein C. Bacterial skin and soft tissue infections in adults: A review of their epidemiology, pathogenesis, diagnosis, treatment and site of care. *Can J Infect Dis Med Microbiol* 2008;19(2):173–84.
4. Lalremruata R, Prakash SK. Prevalence of community acquired-methicillin resistant *Staphylococcus aureus* in patients with skin and soft tissue infections. *Community Acquir Infect* 2014;1:21-4.
5. 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.
6. Furtado S, Bhat RM, Rekha B, Sukumar D, Kamath GH, Martis Jet al. The clinical spectrum and antibiotic sensitivity patterns of staphylococcal pyodermas in the community and hospital. *Indian J Dermatol* 2014;59(2):143-50.
  7. Janardhan B, Prasad GK, Nadeshwar A, Vidyavathi N. Clinico- microbiological study of pyodermas. *International Journal of Recent Scientific Research* 2015;6(5):3820-4.
  8. Palit A, Inamadar AC. Current concepts in the management of bacterial skin infections in children. *Indian J Dermatol Venereol Leprol* 2010;76:476-88.
  9. Phakade RS, Nataraj G, Kuyare SK, Khopkar US, Mehta PR. Is methicillin-resistant *Staphylococcus aureus* involved in community acquired skin and soft tissue infections?: Experience from a tertiary care centre in Mumbai. *J Postgrad Med* 2012;58:3-7.
  10. Ghadage DP, Sali YA. Bacteriological study of pyoderma with special reference to antibiotic susceptibility to newer antibiotics. *Indian J Dermatol Venereol Leprol* 1999;65:177-81.
  11. Gandhi S, Ojha AK, Ranjan KP. Clinical and bacteriological aspects of pyoderma. *North American journal of medical sciences*. 2012 Oct;4(10):492.
  12. Tushar DS, Tanuja DJ, Sangeeta DP, Dipa K, Ninama G. Clinico-bacteriological study of pyoderma with special reference to community acquired methicillin resistant staphylococcus aureus. *National Journal of Integrated Research in Medicine*. 2012 Jan 1;3(1):21-5.
  13. Malhotra SK, Malhotra S, Dhaliwal GS, Thakur A. Bacteriological study of pyodermas in a tertiary care dermatological center. *Indian J Dermatol* 2012;57:358-61.
  14. Bhaskaran CB, Syamasundara PR. Bacteriological study of pyoderma. *Indian J Dermatol Venereol Leprol*. 1989;45:162-70.
  15. Lawrence JN, Facklam RR, Sttneck FO. Epidemiologic studies among American population of Amazonia. Pyoderma prevalence and associated pathogens. *Am J Trop Med Hyg*. 1989;28:54-8.