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**Original Research Article**

# Nasal carriage and recurrent pyodermas

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## ABSTRACT

**Background:** Pyodermas are one of the commonest clinical conditions encountered in dermatological practice especially in pediatric practice. Various factors like poverty, malnutrition, overcrowding and poor hygiene have been stated to be responsible for its high incidence. Recurrent pyoderma is another problem encountered by the dermatologist. Nasal carriage of *S. aureus* has been reported to be an independent risk factor for recurrent pyoderma. The anterior nares are the principal habitat and it has been estimated that some 20% of individuals are persistent nasal carriers; 60-70% are intermittent carriers, about 20% are resistant to nasal colonization.
**Methods:** A study was undertaken to know the common types of pyoderma among patients attending the dermatology OPD in a tertiary care centre in central Kerala. It was also aimed to study the correlation between recurrent pyoderma and nasal carrier state.180patients attending the OPD were studied. They were categorized depending on type of pyoderma. Swabs were taken from the lesions and anterior nares. The results were analyzed using SPSS software.
**Results:** Of the 180 patients studied, 115 had primary pyoderma and 65 had secondary pyoderma. Most common primary pyoderma was impetigo and age group affected was <10 years. 59 patients had recurrent episodes of pyoderma. 43 patients had nasal swab positivity. Of these 43 patients, 30 patients had recurrent pyoderma which is statistically significant.
**Conclusions:** Primary pyodermas are more common than secondary pyodermas and impetigo is still the leading cause of pyoderma. High nasal carriage rates of *S. aureus* is an independent risk factor for recurrence of pyoderma. Treating the nasal carriage is equally important in the management recurrent pyoderma of the skin.

**Keywords:** Pyoderma, Recurrent pyoderma, Nasal carriage

## INTRODUCTION

Pyoderma is defined as "any pyogenic infection of the skin" or "any purulent skin disease".[1]

Pyodermas are one of the commonest clinical conditions encountered in dermatological practice especially in pediatric practice. Various factors like poverty, malnutrition, overcrowding and poor hygiene have been stated to be responsible for its high incidence.

Two organisms often considered to be the etiological agents are coagulase +ve *Staphylococcus aureus* and beta hemolytic streptococci. Recurrent pyoderma is another problem encountered by the dermatologist. Nasal carriage of *S. aureus* has been reported to be an independent risk factor for recurrent pyoderma.[2,3] The predominant

reservoir of *S. aureus* in nature is human being. The transfer of organisms to patients occurs via the hands of personnel. The approximate rate of nasal carriage is 35%. The anterior nares are the principal habitat and it has been estimated that some 20% of individuals are persistent nasal carriers, 60-70% are intermittent carriers, about 20% are resistant to nasal colonization.[4]

***Aims of the study***

1. To study the common types of pyoderma among patients attending the dermatology OPD.
2. To study the correlation between recurrent pyoderma and nasal carrier state.

## METHODS

All patients attending the Dermatology OPD of Govt. Medical college, Kottayam in central Kerala with clinically diagnosed bacterial pyoderma over a period of 18 months from February 2012 to July 2013 were taken up for the study. Skin lesions were carefully categorized into different types based on the presentation. Pus was taken for gram staining and culture in all cases before starting treatment. Nasal swabs were taken in all cases and subjected to gram staining and culture.

Patients with history of treatment with topical or systemic antibiotics during the last two weeks or recent hospitalisation were excluded from the study.

The results were analyzed using SPSS software.

## RESULTS

180 patients who attended the OPD during the study period with pyoderma were included in the study. Among them, 111 (61.7%) were males and 69 (38.3%) were females as shown in Figure 1.

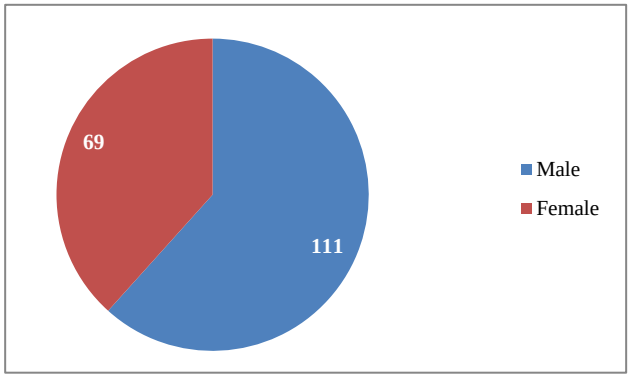


**Figure 1: Sex distribution.**

Highest incidence of pyoderma was noticed in children under 10 years of age accounting for 24.4% of the total cases. 45% of the patients were under 20 years of age as given in Figure 2.

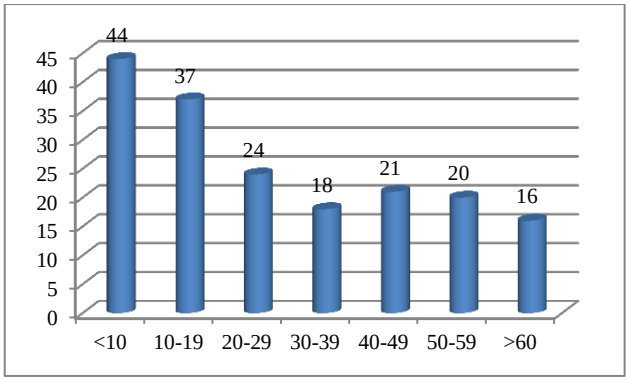


**Figure 2: Age distribution.**

Out of the 180 patients, 115 had primary pyodermas and 65 had secondary pyodermas as given in Figure 3.

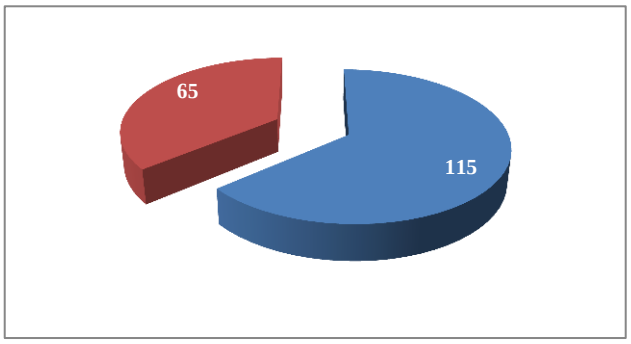


**Figure 3: Types of pyodermas.**

Of the 115 patients with primary pyoderma, the most common type was impetigo and the next common was folliculitis as depicted in Figure 4.

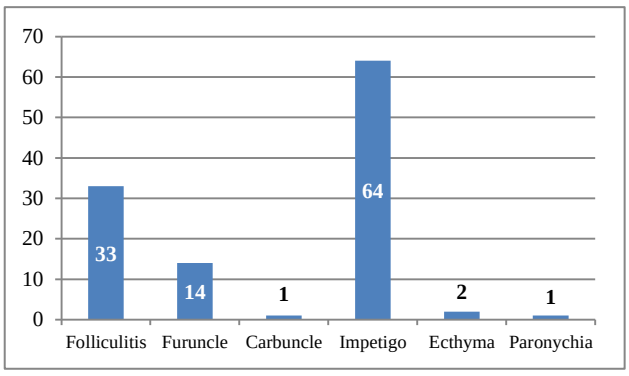


**Figure 4: Types of primary pyodermas.**

Recurrence of pyoderma was noted in 59(32.8%) cases as shown in Figure 5.

Nasal swabs were taken in all cases. Of these, 43 cases had positive nasal swab. 40 patients had growth of *S. aureus*, 2 had *S. pyogenes* and one had both organisms. Among these 43 patients, 30 had recurrent pyoderma as shown in Figure 6.

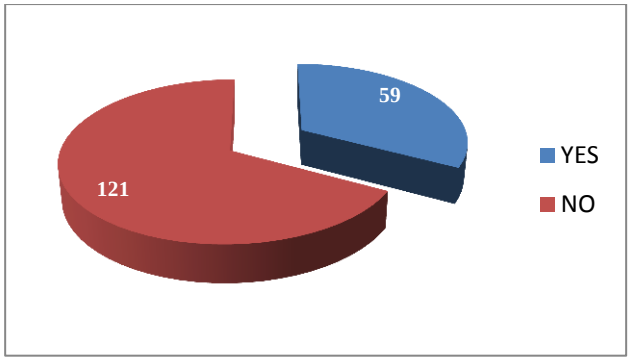


**Figure 5: Recurrence in pyoderma.**

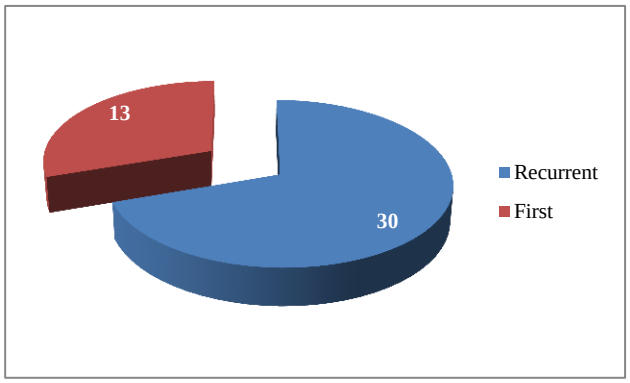


**Figure 6: Recurrence of pyoderma and nasal swab positivity.**

Those with nasal swab positivity had statistically significant incidence of recurrent pyoderma as shown in Table 1.

**Table 1: Recurrence and positive nasal swab-statistical analysis.**

| | Recurrence | | Total |
|---|---|---|---|
| **Nasal** | No | Yes | |
| **No** | 108 | 29 | 137 |
| **Yes** | 13 | 30 | 43 |
| **Total** | 121 | 59 | 180 |

Chi square value -35.082; P value<0.001.

## DISCUSSION

Highest incidence of pyoderma was noticed in children under 10 years of age accounting for 24.4% of the total cases. 45% of cases were under 20 years of age. 56.25% of cases of impetigo were observed in childern less than 10 years of age. This is in agreement with studies by Nagaraju et al, Nishijima et al, Chopra et al and Saxena et al.[2,5-7] Children are more prone for pyoderma probably because defense factors against cocci are poorly developed in children.[8] Moreover, skin lipids which have a protective role are much less in the skin of children.[9] Trauma, poor hygiene, malnutrition and increased chance of close contact which are important predisposing factors for pyoderma are also more frequently seen in children.

Secondary pyodermas had the highest occurrence in adults probably, because leg ulcers and eczemas contributed the bulk of the disease.

61.7% of the patients were males. This is in agreement with studies by Nagaraju et al, Tan et al and Saxena et al.[5,7,10]

43 patients (23.9%) showed culture positivity in nasal swab of which 30 were having recurrent pyoderma. 31 out of 43 nasal isolates (72%) had same sensitivity pattern as that of pus culture. Statistical analysis to find out the correlation between recurrence of pyoderma and nasal carriage of pathogen using chi square test showed significant association with chi square value of 35.082 and a $p<0.001$. Nagaraju et al and Kakar et al have also suggested the possibility of recurrence of pyoderma due to nasal carriage.[5,11]

## CONCLUSION

Primary pyodermas are more common than secondary pyodermas and impetigo is still the leading cause of pyoderma.

High nasal carriage rates of *S. aureus* is an independant risk factor for recurrence of pyoderma. Treating the nasal carriage is equally important in the management recurrent pyoderma of the skin.

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