



MRSA COLONISATION AND DISEASE SEVERITY IN ATOPIC DERMATITIS

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ABSTRACT

Introduction: Atopic dermatitis is an eczematous highly pruritic chronic inflammatory skin disease. Atopic dermatitis patients are more frequently colonised by *Staphylococcus aureus* and MRSA when compared with healthy people. In this study we have attempted to find out the proportion of patients with MRSA colonisation in Atopic dermatitis and to find out any association between MRSA colonisation and disease severity.

Materials and methods: After taking informed consent from the patient/ guardian, clinical details were collected. Two swabs were collected one from the anterior nares and the other from the affected area from the skin and send for culture and sensitivity.

Result: The prevalence of *Staph aureus* in the study population was 62.7% and MRSA was 13.3%. All MRSA strains were sensitive to Vancomycin and Linezolid.

Conclusion: We didn't find a statistically significant association between MRSA colonisation and disease severity. The information collected in this study helped to know the prevalence of MRSA in our region and the antibiotic sensitivity pattern.

KEYWORDS : Atopic dermatitis, *Staph aureus*, MRSA, colonisation**INTRODUCTION**

Atopic dermatitis is a common chronic skin condition frequently associated with *Staph aureus* colonisation and infection. Cutaneous infection with *Staph aureus* plays a major role in the exacerbation of atopic dermatitis. Heavy skin colonisation with *Staph aureus* has been reported in patients with atopic dermatitis even if the skin is not clinically infected and this may contribute to continuing disease activity. Patients with atopic dermatitis may show increased adherence of *Staphylococci* to both skin and mucus membrane surfaces and *staph aureus* may have specific binding sites, possibly protein A or Teichoic acid in the cell wall for the fibronectin and laminin in the tissues. [1]

Atopic dermatitis skin harbours a different environment for bacterial growth than normal skin. A dysfunctional physical skin barrier leads to an increase in pH on the skin surface that favours the growth of *Staph aureus*. MRSA colonisation is common in atopic dermatitis and a significant association between MRSA colonisation and disease severity was found. [2]

Materials and methods

- 1) Aim of the study
 - a) To find out the proportion of patients with MRSA colonisation in atopic dermatitis.
 - b) To find out any association between MRSA colonisation and severity of atopic dermatitis.
- 2) Study design – cross sectional study.
- 3) Study setting – Department of Dermatology and Microbiology, Government Medical College(GMC) Trivandrum
- 4) Study period -1 year
- 5) Study population - all patients attending OP/IP wings of Dermatology GMC Trivandrum, who were diagnosed as atopic dermatitis using Hanifin and Rajka criteria. [3]
- 6) Exclusion Criteria
 - a) Patients with a history of recent antibiotic use, either systemic or topical in the past two weeks.
 - b) Patients not willing to participate in the study

Ethical clearance was obtained from the institutional ethics committee. Informed written consent was taken from the participants /guardian. All information was kept confidential. Two swabs were taken from the anterior nares and skin lesions of each patient, sent for culture and sensitivity. Swabs were inoculated on Blood agar, Mac Conkey agar and Mannitol Salt agar and incubated

at 37°C for 24 hours. Gram smear was taken and *Staph aureus* was identified by standard methods [4]. MRSA was identified as per Clinical Laboratory Standard Institute Guidelines using Cefoxitin disc [5]. The resistance pattern of MRSA was determined for Oxacillin (1µg), Erythromycin (15µg), Clindamycin (2µg), Gentamicin (10µg), Amikacin (30µg), Cephalexin (30µg), Rifampicin (5µg), Linezolid(30µg), Vancomycin (30µg) using antibiotic disc (Hi Media) by Kirby-Bauer disc diffusion method.

Result

75 patients with atopic dermatitis were enrolled in the study. *Staph aureus* was isolated in 47 (62.7%) patients either from the skin or anterior nares or from both sites.

Table – 1 Bacterial Culture

Name of organism	No isolated	Percentage
<i>Staph aureus</i>	44	58.7
Sterile	28	37.3
<i>Staph aureus</i> & <i>Klebsiella</i> spp	3	4
Total	75	100

Staph aureus was isolated from 47 patients.

Table – 2 Proportion Of Mrsa And Mssa

Organisms	Number Isolated	Percentage
MRSA	10	13.3
MSSA	37	49.3

Total prevalence of MRSA was 13.3%

Out of the 10 patients with MRSA, in 3 patients MRSA was present in the nose alone and in 3 patients in the skin alone and in 4 patients in both sites. Out of the 37 patients with MSSA, in 11 patients it was isolated from the nose and in 11 from the skin and in 15 from both sites.

TABLE – 3 PROPORTION OF MRSA AND MSSA IN SKIN AND NOSE

Organism	Nose	Skin	Both Sites	Total
MRSA	3(30%)	3(30%)	4(40%)	10
MSSA	11(29.7%)	11(29.7%)	15(40.6%)	37

MRSA was sensitive to Vancomycin and Linezolid in all patients, Rifampicin in 8 patients, Amikacin in 6 patients, Gentamicin and

Clindamycin in 1 each. Penicillin and Erythromycin were resistant in all patients.

Maximum number of cases was in the age group of 0-2 years. The youngest patient was 1 month old and the oldest was 70 years old. There are 40 males and 35 females with a male-female ratio 1.14:1

Discussion

The present study included all patients with atopic dermatitis irrespective of the age group. Maximum number of patients was in the infantile phase (0-2 years). The mean age of the study group was 6 years. The study by Scarria et al and Nnoruka et al included patients of all age groups similar to our study with the mean age of 13.8 years. [6, 7]

There is a slight male predominance with a male-female ratio of 1.14:1. Indian study by Dhar et al (1.09:1) and Kant et al (1.5:1) showed a male predominance similar to our study. [8, 9]

Out of the 75 patients Staph aureus was isolated from 47 patients (62.7%) and MRSA was isolated from 10 patients (13.3%). Prior hospital admission and chronic eczema are risk factors for Staph aureus and MRSA colonisation. MRSA was isolated from 8% of patients in the study by Farajzadeh et al and 13% in the study by Rezaei et al. Results of these studies collaborate with our findings. [10, 11]

MRSA isolated was sensitive to Vancomycin and Linezolid in all patients (100%), Amikacin in 60% of patients. It was resistant to Penicillin and Erythromycin. In the Chinese study by Hon et al MRSA shows 100% sensitivity to Vancomycin [12]. Prolonged and unnecessary antibiotic treatment in patients with atopic dermatitis increases drug resistance and occurrence of MRSA. As a result we must be careful in prescribing antibiotics to such patients to prevent drug resistance. Our study group had a large proportion of mild and moderate cases of atopic dermatitis may be one reason for not getting an association between disease severity and MRSA colonisation.

Conclusions and recommendations

- i. Majority of patients belonged to the age group of 0-2 years.
- ii. Males were more affected than females with a male-female ratio of 1.4:1
- iii. Staph aureus was isolated from 47 (62.7%) patients.
- iv. Out of these 47 patients MRSA was present in 10 and all MRSA isolates were sensitive to Vancomycin and Linezolid.

We did not find a statistically significant association between MRSA colonisation and disease severity. More researches with a large sample size and control group may help for the identification of exact relationship between MRSA colonisation and severity of atopic dermatitis.

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