

Socioeconomic and Nutritional Status of Children with Pyodermas

Kharel C¹, Pandey SS², Agrawal S³, Bhattarai M⁴

¹Lecturer, Department Of Dermatology, Venereology and Leprology, Nepal Medical College and Teaching Hospital, Kathmandu; ²Professor, Department Of Dermatology, Venereology and Leprology, Banarus Hindu University, Banarus, India; ³Professor, Department Of Dermatology, Venereology and Leprology, B.P. Koirala Institute of Health Sciences, Dharan, Nepal; ⁴Health Specialist, The World Bank, Nepal Country Office.

Abstract

Introduction: Although adults are affected by pyodermas, they are commonly seen in school going children. Children usually acquire infections through contacts either from other children or with fomites. Low socioeconomic status, poor personal hygiene, undernutrition and immunosuppression interplay with each other and predispose children to pyodermas.

Objectives: This study was conducted to find out the socioeconomic status and nutritional profile of children with pyoderma and their association with recurrence of disease.

Materials and Methods: This was a hospital based cross-sectional study carried out for one year. Newly diagnosed cases of pyoderma in children less than 14 years were enrolled for the study. Kuppuswamy scale was used to evaluate the socio-economic status of the families. Weight was taken as the indicator of nutrition and compared with the norm set up by the Indian Association of Pediatrics (IAP). Data were fed into STATA v. 11.1 and we found out the risk between the recurrence of disease and the socioeconomic and nutritional status of the children by calculating prevalence risk ratios.

Results: Out of 107 children with pyoderma included in this study, there were 64 (59.8%) males and 43 (40.2%) females and the male to female ratio was 1.48:1. Children who belonged to lower socioeconomic strata (lower, upper-lower and lower-middle socio-economic groups) constituted almost 74% of the study population. According to the IAP standard, the nutritional status of a significant proportion (23.4%) of children with pyoderma was below the norm. There were significant risks of having recurrence of disease in children with lower socioeconomic status ($p=0.014$) and lower nutritional status ($p=0.028$).

Conclusion: This study highlights the presence of poor socioeconomic and nutritional status in children with pyodermas. Persistence of these factors may also lead to recurrence of the disease. This study opens avenues to conduct further large studies to investigate and address these issues.

Keywords: Pyoderma, socio-economic status and nutritional factor

Corresponding Author:

Dr. Chandani Kharel,

Department Of Dermatology, Venereology and Leprology,

Nepal Medical College and Teaching Hospital (NMCTH), Jorpati, Kathmandu

Email: kharu2000@yahoo.com

Introduction

Skin diseases affect everyone from neonates to geriatric people. Dermatoses are global health problem among children and are major factors responsible for causing morbidities. Dermatological problems manifesting as primary and secondary cutaneous complaints, constitute at least 30% of all outpatient visits to a paediatrician and 30% of all visits to dermatologists has patients from paediatric age group.¹ Paediatric dermatoses can be divided into three major groups i.e infective dermatoses, non-infective dermatoses and nutritional deficiency dermatoses respectively.² Skin of the children is more susceptible to cutaneous infections and infestations due to immature immune system and more exposure to sub clinical infectious carriers in the school and within the family itself.^{2,3}

Children usually acquire infections through contacts either from other children or with fomites. Low socioeconomic status, poor personal hygiene, undernutrition and immune-suppression interplay with each other and predispose children to pyodermas.^{2,4} WU et al has shown that the prevalence of skin infections are much higher in poor rural areas than in the city.⁵

A low socioeconomic status may lead to poor personal hygiene and poor nutritional intake which further may lead to weak immune status that can predispose to pyodermas. Therefore, we need to first identify and then find ways to address these issues to engender a successful treatment outcome and decrease morbidity and school absenteeism of children. To our knowledge, in Nepal, there is no published literature which has looked into the socio-economic status and nutritional profile of children with pyodermas and their association with recurrence of the disease. Therefore, this study aims to:

1. Find out the socio-economic and nutritional status of children with pyoderma
2. Investigate the association of socio-economic status with recurrence of disease
3. Investigate the association of nutritional status with recurrence of disease

Materials and Methods

The study is a cross sectional study carried out over a period of one year (August-July 2005) in a tertiary care hospital (B.P.Koirala Institute of Health Sciences) in Eastern Nepal. All newly diagnosed children aged 0-14years with pyodermas were included in the study. Those taking antibiotics before coming to the OPD of Dermatology in the preceding two weeks were excluded from the study in order to take a swab from the lesion for bacteriological culture/sensitivity, thereby institute appropriate antibiotics.

Kuppuswamy scale was used to evaluate the socio-economic status of the families.⁶ We considered weight as an indicator of nutrition and compared with the norm set up by the Indian Association of Pediatrics.⁷

Besides the demographic data, family size and whether the child presented with similar lesions in the past (recurrence) were also recorded.

The study was passed by the ethical review board of the institute and informed consent was taken from the parent/guardian of the child.

The data were fed into the statistical software STATA v.11.1 and the proportion of children with different socio-economic status (SES) and various protein-energy-malnutrition (PEM) were tabulated. We investigated the risks of having recurrence of disease with the socioeconomic and nutritional status of the children by calculating prevalence risk ratios. A p value of less than 0.05 was taken as having a significant risk of recurrence. To do this, we clubbed five classes of SES in Kuppuswamy scale into two strata (Higher strata= Upper and Upper-middle classes; Lower strata= Lower-middle, upper-lower and lower classes) for the sake of convenience due to small sample size in some classes. Similarly, to look at the nutritional status and its risk of having a recurrence, we divided children into those who had normal nutritional status and those who had any grade of PEM.

Original Article**Results**

The total number of children (up to 14 years) that attended the dermatology outpatient department at BPKIHS from August 2004 to July 2005 was 2162. There were 552 children who had pyoderma, hence the overall frequency of pyoderma in children was 25.5%.

Out of 107 patients of pyoderma included in this study, there were 64 (59.8%) males and 43 (40.2%) females and the male to female ratio was 1.48:1. The age of the patients ranged from 4 days -13 years with the mean age of 4.3 ± 3.5 years.

There were 74 children (69.2%) who came from nuclear family whereas the remaining 33 (30.8%) came from joint families.

According to the Kuppuswamy scale used for the grading of the socioeconomic status of the

children, majority of the patients belonged to upper lower socioeconomic status with almost equal number in the upper middle and lower middle status (Table 1).

According to the IAP standard, the nutritional status of a significant proportion (23.4%) of children with pyoderma was below the norm (Table 2).

We found a higher risk of having recurrent episodes (Prevalence Ratio=2.24, p=0.014) in children who belonged to lower socio-economic strata than those who belonged to higher socio economic strata (Table 3).

Similarly, children who had some form of PEM had a significantly greater risk of recurrent episodes of the disease (Prevalence Ratio=1.70, p=0.028) (Table 4).

Table 1: Socio-economic status of children with pyodermas

Socio-economic class	Scale	No of patients (%)
Upper (I)	26-29	1 (0.9%)
Upper middle (II)	16-25	27 (25.2%)
Lower-middle (III)	11-15	26 (24.2%)
Upper-lower (IV)	5-10	50 (46.7%)
Lower (V)	<5	3 (2.8%)

Table 2: Nutritional status of enrolled children

Nutritional status	IAP Score	No of enrolled children	Percentage (%)
No PEM	= 81% of normal weight	82	76.6%
Grade I PEM	71- 80% of normal weight	20	18.7%
Grade II PEM	61-70% of normal weight	3	2.8%
Grade III PEM	51-60% of normal weight	2	1.9%
Grade IV PEM	= 50% of normal weight	0	0%

Table 3: Risk ratio of recurrent episodes between different socio-economic strata

Socio-economic status	Single Episode, n(%)	Recurrent Episode, n(%)	Total, n (%)
Lower Strata (Lower-middle, upper-lower and lower classes)	41 (51.9%)	38 (48.1%)	79 (100%)
Higher Strata (Upper and Upper-middle classes)	22 (78.6%)	6 (21.4%)	28 (100%)
Total, n (%)	63 (58.9%)	44 (41.1%)	107 (100%)

Prevalence ratio for recurrent episodes = 2.24 p = 0.014

Table 4: Risk ratio of recurrent episodes between different nutritional status categories

Nutritional status episode, n (%)	Single Episode, n (%)	Recurrent	Total, n (%)
PEM (Grade I, II & III)	10 (40.0%)	15 (60.0%)	25 (100%)
No PEM	53 (64.6%)	29 (35.4%)	82 (100%)
Total, n (%)	63 (58.9%)	44 (41.1%)	107 (100%)

Prevalence ratio of recurrent episodes=1.70, p = 0.028

Discussion

This study used Kuppuswamy scale, which originated from India, in order to categorize SES keeping in view that Nepal and India have similar geographical, economical and cultural background. Majority of the children (almost 74%) belonged to lower strata in this study and is comparable to other studies done in India.^{8,9} Lower socio economic strata may contribute to poor nutrition leading to lower immunity status and thereby precipitate skin infections. Lower economic status also may contribute to poor housing standards and overcrowding. In a study conducted in N. Delhi, a history of overcrowding was obtained in 87% of cases.⁸ Joint families would be a place for overcrowding and transmission of infectious diseases but in this study most children (68.9%) belonged to nuclear family which may as well be overcrowded. Our hospital caters semi-urban population, so the number of rooms in the houses, standard of living and the hygiene condition may not be up to adequate need. Fomite transmission is one of the

known factors for the propagation of disease in the members of the family.

In this study, weight was taken as the indicator of nutrition and compared with the norm set up by the Indian Association of Pediatrics. Although we found a significant proportion of children (23%) with some grade of PEM, a research in India showed that more than 80% of the children were undernourished.⁸ Even though both these studies are hospital based, the difference may be due to the fact that the hospitals are catering different sorts of population.

The second and third objectives of the study were to investigate the association of socio-economic and nutritional status with recurrence of disease. The finding of significant risk ratios of both these factors with recurrence indicates that these factors may be important risk factors for skin infections. These may indirectly relate to poor personal hygiene and directly to lower immune status which precipitate pyodermas. Persistence of these factors may also lead to recurrence of the disease.

Original Article

However, this study is not without limitations. The major drawback is that it is a cross-sectional study which is inferior to cohort study to investigate the association between two factors. It would have been better to follow up children with pyodermas over a long period and see the effect of intervention on socio economic and nutritional status on the recurrence of disease. Anyway, this study opens avenues to conduct further large studies to investigate and address these issues.

Conclusion

This study highlights the presence of poor socioeconomic and nutritional status in children with pyodermas. Persistence of these factors may also lead to recurrence of the disease. We may have to address these issues in order to bring a lasting treatment outcome in these children and decrease morbidity and school absenteeism.

References:

1. Thappa DM. Common skin problems. *Indian J Pediatr.* 2002 Aug; 69(8):701-6.
2. Bhatia V. Extent and pattern of paediatric dermatoses in rural areas of central India. *Indian J Dermatol Venereol Leprol.* 1997 Jan-Feb;63(1):22-5.
3. Sharma RC, Mendratta V. Clinical profile of cutaneous infections and infestations in the paediatric age group. *Ind J Dermatol.* 1999;44(4):174-8.
4. Negi KS, Kandpal SD, Parsad D. Pattern of skin diseases in children in Garhwal region of Uttar Pradesh. *Indian Pediatr.* 2001 Jan;38(1):77-80.
5. Wu YH, Su HY, Hsieh YJ. Survey of infectious skin diseases and skin infestations among primary school students of Taitung County, eastern Taiwan. *J Formos Med Assoc.* 2000 Feb;99(2):128-34.
6. Mishra D, Singh HP. Kuppuswamy's socioeconomic status scale--a revision. *Indian J Pediatr.* 2003 Mar;70(3):273-4.
7. Ghai OP, Gupta P and Paul VK. Growth and development. Chapter 1. In *Essential Pediatrics.* 5th edition, 2000: 1-39.
8. Kakar N, Kumar V, Mehta G, Sharma RC, Koranne RV. Clinico-bacteriological study of pyodermas in children. *J Dermatol.* 1999 May;26(5):288-93.
9. Mathew MS, Garg BR, R K. A Clinico-bacteriological Study of Primary Pyodermas of Children in Pondicherry. *Indian J Dermatol Venereol Leprol.* 1992;58(3):183-7.