Socioeconomic and Nutritional Status of Children with Pyodermas

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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

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Skin diseases affect everyone from neonates to geriatrics. Dermatoses are global health problems among children and are major factors responsible for causing morbidity (1).

The study is a cross sectional study carried out over a period of one year (August-July 2005) in a tertiary care hospital (BPKIHS, Institute of Health Sciences) in Eastern Nepal. All newly admitted children from the OPD of dermatology during the preceding two weeks were included in the study. Those diagnosed children aged 0-14 years with positive clinical signs and symptoms were further selected to take a swab for culture. Children admitted to the hospital with positive cultures but presenting similar clinical signs and symptoms were also included in the study.

Materials and Methods

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 diagnosis of PEM was done as per the modified Kuppuswamy scale (2).

The data were fed into the statistical software STATA 11.1 and the proportion of children with PEM was calculated. We investigated the risks of having PEM in children with different socio-economic status (SES). We further studied the association between PEM and skin infections.

The study aims to:

1. Identify the socio-economic and nutritional status of children with PEM
2. Investigate the association between PEM and skin infection
3. Investigate the association between PEM and skin infection in children with PEM

The study has found that children with PEM are more likely to be infected with skin infections. This finding is consistent with previous studies in the field. Further research is needed to understand the underlying mechanisms and develop effective interventions to reduce the burden of PEM and skin infections in children.
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 pyodemas

<table>
<thead>
<tr>
<th>Socio-economic class</th>
<th>Scale</th>
<th>No of patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper (I)</td>
<td>26-29</td>
<td>1 (0.9%)</td>
</tr>
<tr>
<td>Upper middle (II)</td>
<td>16-25</td>
<td>27 (25.2%)</td>
</tr>
<tr>
<td>Lower-middle (III)</td>
<td>11-15</td>
<td>26 (24.2%)</td>
</tr>
<tr>
<td>Upper-lower (IV)</td>
<td>5-10</td>
<td>50 (46.7%)</td>
</tr>
<tr>
<td>Lower (V)</td>
<td>&lt;5</td>
<td>3 (2.8%)</td>
</tr>
</tbody>
</table>

Table 2: Nutritional status of enrolled children

<table>
<thead>
<tr>
<th>Nutritional status</th>
<th>IAP Score</th>
<th>No of enrolled children</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No PEM</td>
<td>= 81% of normal weight</td>
<td>82</td>
<td>76.6%</td>
</tr>
<tr>
<td>Grade I PEM</td>
<td>71- 80% of normal weight</td>
<td>20</td>
<td>18.7%</td>
</tr>
<tr>
<td>Grade II PEM</td>
<td>61-70% of normal weight</td>
<td>3</td>
<td>2.8%</td>
</tr>
<tr>
<td>Grade III PEM</td>
<td>51-60% of normal weight</td>
<td>2</td>
<td>1.9%</td>
</tr>
<tr>
<td>Grade IV PEM</td>
<td>= 50% of normal weight</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>
Table 3: Risk ratio of recurrent episodes between different socio-economic strata

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

Prevalence ratio for recurrent episodes = 2.24, p = 0.014

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

<table>
<thead>
<tr>
<th>Nutritional status episode, n (%)</th>
<th>Single Episode, n (%)</th>
<th>Recurrent</th>
<th>Total, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEM (Grade I, II &amp; III)</td>
<td>10 (40.0%)</td>
<td>15 (60.0%)</td>
<td>25 (100%)</td>
</tr>
<tr>
<td>No PEM</td>
<td>53 (64.6%)</td>
<td>29 (35.4%)</td>
<td>82 (100%)</td>
</tr>
<tr>
<td>Total, n (%)</td>
<td>63 (58.9%)</td>
<td>44 (41.1%)</td>
<td>107 (100%)</td>
</tr>
</tbody>
</table>

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 pyoderma. Persistence of these factors may also lead to recurrence of the disease.
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 pyoderma 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 pyoderma. 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: