Prevalence and Risk Factors Associated with Anaemia Amongst Adolescent Girls Attending in Pediatrics OPD of Nepalgunj Medical College

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ABSTRACT
Background: The habits that children inculcate during adolescence remains with them throughout the life. Anaemia is one of the most prevalent health conditions amongst the Girls residing in developing countries. The present study was conducted with the aim to determine the prevalence and risk factors associated with anaemia amongst adolescent girls attending in paediatrics OPD of Nepalgunj Medical College. Materials and methods: The present cross sectional study was performed for a period of one year (February 2016 - March 2017). This study was conducted amongst the girls attending to the Paediatrics department of Nepalgunj Medical College and Teaching Hospital, Nepalgunj. The study included all the girls aged between 10-19 years. Each Girls underwent physical examination under trained supervision to record sign of anaemia like pallor. Body mass index of all the subjects was also calculated. The data obtained was arranged in a tabulated form and analysed using SPSS software. Results: A total of 200 girls were enrolled in this study. The mean age of the study sample was 21.10+-10.67 years. Majority of the early adolescents (68.5%) had anaemia. Least number (36%) of anaemic patients was seen in mid adolescence. There were 47.5% girls in late adolescence that showed signs of anaemia. There were 47.9% Girls who had passage of worms and 50.1% had no worm infestations. Majority (63.5%) of non anaemic Girls were in their post menarche stage. Conclusion: There were 52% of the girls who were anaemic in our study. The proportion of undernourished girls were significantly higher, therefore body mass index significantly affects anaemia.

Key words: Adolescence, anaemia, haemoglobin

INTRODUCTION
Adolescents are defined as Girls who are aged between 10 to 19 years of age; this definition is as per World health organisation. It is regarded as transition from childhood to adulthood. Out of 2.7 million population of Nepal, there are 23% adolescentst. The habits that children inculcate during adolescence remains with them throughout the life. At this stage a child is at his cross roads and they make important and crucial decisions during this stage. According to World Health Organisation, anaemia is defined as a condition in which haemoglobin falls to less than 11g/dl for Girls aged less than 6 years and haemoglobin less than 12 g/dl for Girls more than 6 years. Anaemia is one of the most prevalent health problem amongst the Girls residing in developing countries. The epidemiology of anaemia varies amongst different nations according to ecology and sociocultural environment. As per a Nepalese survey that was conducted in 2006, there were 48% subjects who were anaemic between the age group of 6-59 months. According to some other studies there is 42-60% population of Nepal was anaemic. There have not been much surveys concentrating only on adolescent subjects especially girls. The availability of iron is a crucial factor amongst girls especially in the reproductive age group. Due to this reason special attention needs to pay to girls of this age group. Therefore the present study was conducted with the aim to determine the prevalence and risk factors associated with anaemia amongst adolescent girls attending in paediatrics OPD of Nepalgunj Medical College.

MATERIALS AND METHOD
The present cross sectional study was carried out for a period of one year (February 2016- March 2017). This study was conducted amongst the girls attending to the Paediatrics department of Nepalgunj Medical College and Teaching Hospital, Nepalgunj. The study included all the girls aged between 10-19 years. Unmarried, non lactating girls with premenarcheal stage. There were 48.1% who were overweight. There was a significant difference in BMI amongst anaemic and non anaemic Girls.

Procedure- under complete aseptic condition, 5 ml of venous blood was withdrawn from the anticubital vein and stored in EDTA vial. Haemoglobin estimation was done using cyanmethaemoglobin method. Recording of anaemia was done as per the World Health organisation protocol. The data obtained was arranged in a tabulated form and analysed using SPSS software. Chi square test and Man Whitney test were applied as a test of significance. Probability value of less than 0.05 was considered significant.
RESULTS
A total of 200 girls were enrolled in the study. The mean age of the study sample was 21.10±10.67 years. Table I shows the prevalence of anaemia. There were 104 Girls (52%) in which the level of haemoglobin was less than 12 g/dl. Approximately 48% Girls (n=96) had haemoglobin more than 12 g/dl.

Table II shows age wise distribution of the anaemic patients. Majority of the early adolescents (68.5%) had anaemia. Least number (36%) of anaemic patients was seen in mid adolescence. There were 47.5% girls in late adolescence that showed signs of anaemia. There were 52.5% Girls in late adolescence and 64% Girls in mid adolescence who were not anaemic.

Out of the anaemic population, there were 67.3% vegetarian and 32.6% non-vegetarian. There were 51.9% subjects who had passage of worms and 48.1% had no worm infestations. Majority (64.4%) of anaemic subjects were in their premenarcheal stage. There were 48.1% who were undernourished, 38.5% subjects had normal BMI and rest were overweight. Out of the non anaemic population, there were 23.9% vegetarian and 76.1% non vegetarian. There were 47.9% Girls who had passage of worms and 50.1% had no worm infestations. Majority (63.5%) of non anaemic Girls were in their post menarche stage. There were 27% who were undernourished, 52.1% Girls had normal BMI and rest were overweight. There was a significant difference in BMI amongst anaemic and non anaemic Girls.

DISCUSSION
Approximately 1 billion people in the world are iron deficient, nutritional deficiency is the major cause of anaemia. There is scarcity of data on the prevalence of anaemia amongst the adolescent girls. As per the present study, there were 52% subjects who were anaemic. In the studies conducted by Chaturvedi et al and Ahmed F et al the prevalence of anaemia was 40 to 60%.

### Table I: Prevalence of anaemia

<table>
<thead>
<tr>
<th>HAEMOGLOBIN</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;12g/dl</td>
<td>104</td>
<td>52</td>
</tr>
<tr>
<td>&gt;12g/dl</td>
<td>96</td>
<td>48</td>
</tr>
</tbody>
</table>

### Table II: Prevalence of anaemia amongst different age groups

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>ANEMIC N=104</th>
<th>NON ANEMIC N=96</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet consumed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetarian</td>
<td>70 (67.3%)</td>
<td>23 (23.9%)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Non vegetarian</td>
<td>34 (32.6%)</td>
<td>73 (76.1%)</td>
<td></td>
</tr>
<tr>
<td>Passage of worms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>54 (51.9%)</td>
<td>46 (47.9%)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>No</td>
<td>50 (48.1%)</td>
<td>50 (50.1%)</td>
<td></td>
</tr>
<tr>
<td>Menstrual status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre menarche</td>
<td>67 (64.4%)</td>
<td>35 (36.5%)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Post menarche</td>
<td>37 (35.6%)</td>
<td>61 (63.5%)</td>
<td></td>
</tr>
<tr>
<td>Nutritional status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undernourished</td>
<td>50 (48.1%)</td>
<td>26 (27%)</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Normal</td>
<td>40 (38.5%)</td>
<td>50 (52.1%)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>overweight</td>
<td>14 (13.4%)</td>
<td>14 (14.6%)</td>
<td>&gt;0.05</td>
</tr>
</tbody>
</table>

### Table III: Prevalence of anaemia according to personal characteristics
there were 42.4% Girls at school of Morang, 31.6% Girls at
school of Udaipur, 45.3% children at school of Bhojpur and
34.8% in school of Ilam district that were anaemic. The
increased prevalence of anaemia amongst the girls is chiefly
due to deficiency of iron. In our study, out of the anaemic
population, there were 67.3% vegetarian and 32.6% non
vegetarian. There were 51.9% Girls who had passage of
worms and 48.1% had no worm infestations. Majority (64.4%)
of anaemic Girls were in their premenarcheal stage. There were
48.1% who were undernourished, 38.5% Girls had normal BMI
and rest were overweight.

Out of the non anaemic population, there were 23.9%
vegetarian and 76.1% non vegetarian. There were 47.9% Girls
who had passage of worms and 50.1% had no worm
infestations. Majority (63.5%) of non anaemic Girls were in
their post menarche stage. There were 27% who were
undernourished, 52.1% Girls had normal BMI and rest were
overweight. There was a significant difference in BMI amongst
anaemic and non anaemic subjects. In a study conducted by
Gupta et al13 Body mass index was not significantly associated
with anaemia amongst the girls. As per a study conducted by P.
Kanodia et al14 majority of the under nourished girls were
anaemic similar to our study. As per our study, majority of the
early adolescents (68.5%) had anaemia. Least number (36%) of
anaemic patients was seen in mid adolescence. There were
47.5% girls in late adolescence that showed signs of anaemia.
There were 52.5% Girls in late adolescence and 64% subjects in
mid adolescence who were not anaemic. In a study conducted
by Verma et al15 amongst children of Punjab, India, there were
higher proportion of vegetarian girls who were anaemic as
compared to non vegetarian girls. In our study, worm
infestations were another major cause of anaemia. Iron
supplementation with regular deworming sessions can help
reduce the incidence of anaemia amongst girls. Community
based programs should be initiated by the authorities to
reduce its occurrence. Students should also be educated
towards importance of nutrition in daily life.

CONCLUSION

There were 52% of the girls who were anaemic in our study. The
proportion of undernourished girls were significantly higher,
therefore body mass index significantly affects anaemia
occurrence. Educational programmes and medical checkups
should be conducted at regular interval at both institute and
community to encourage an anaemia free nation.

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