Cause of night blindness in children – Alarming effect of water pollution

Abstract
The demonstration of cysts of Giardia lamblia from the concentrative faecal samples revealed the presence of Giardiasis in children with diarrhoea. The quantitative estimation of vitamin A from the serum specimen of healthy and infected patients have disclosed the association of steatorrhea with malabsorption. There was a progressive loss of Vitamin A with respect to the infection of the protozoan understudy. The results are discussed with relation to the preventive measures. It is suggested that the schools should provide protected water bleached with iodine and boiled.

Key words: Giardiasis, Giardiasis and night blindness, Giardiasis and vit A deficiency

The flagellate protozoan dwelling in the intestine is known as Giardia lamblia. The trophozoite causes infection in the epithelial sells of intestine. It is asymptomatic. It may vary from diarrhoea with vague epigastric pain to full malabsorption syndrome with steatorrhea. The disease is known as Giardiasis. The infection is due to the contamination of live cysts from human faeces and polluted water with cysts. Since lack of personal hygiene results in the infection, it is common among children. The present study was conducted to investigate whether Giardiasis is found in children with diarrhoeal syndrome. Attempt has also been made to seek an analogue with deficiency of vitamin A.

The faecal samples and blood specimens from children with diarrhoea of over 10 days prior to treatment were the materials used for the demonstration of pathogen. Drinking water samples were also examined for the presence of cysts from the schools of afflicted children.

The results have shown the occurrence of Giardiasis among children. The frequency was one in four (21/84) cases of diarrhoea over long duration. The observed cysts in water samples disclose the contamination of live cysts. The quantitative estimation of serum vitamin A level in healthy children and infected children are summarized in Table 1.

In unaffected children, it was calculated as mean values of 15.259, 15.487, 16.058 and 16.001 mg vitamin A per 100 ml serum at different days (5, 10, 15 and 20). On the contrary the corresponding recordings of serum vitamin A from the children with Giardiasis were reduced mean values. There were only 11.888, 11.146, 10.244 and 9.777 mg/100 ml [Table 1]. The foregoing results it would be reasonable to suggest the occurrence of Giardiasis and malabsorption resulting in the deficiency of vitamin A.

The association of steatorrhea with the infection of Giardia has been observed on the basis of damaging the intestinal mucosa, causing functional derangements, reducing brush border enzymes along with other factor such as synergism with agents like Salmonella and rotavirus. This is evidenced by the determination of vitamin A deficiency in this present study. There is a progressive loss of vitamin A with respect to the infection of the Giardia. The highlight of the present investigation is that it is difficult to diagnose the indication of vitamin A deficiency with Giardiasis. However, there may be a chance of impairment of dark adoption and inadequate hepatic retinol reserve when the serum level will fall below 10 mg. Nevertheless, vitamin A depletion also affects the functioning of intestinal mucosa and causes loss of goblet cells. This may lead to the increasing susceptibility to the trophozoites.

The study on Giardia and giardiasis...
is of environmental interest. The cysts of Giardia mimic another non-pathogen like Chilomastix, Enteromonas, Retortamonas. So they may be mistaken for Giardia lamblia. The rate of transmission is higher than other protozoan. There is no specific chemotherapy. It requires treatment with metronidazole. Therefore, Giardiasis should be apprehended. The ordinary chlorination of municipal water does not kill Giardia cysts. The extra iodine bleach or boiling can only be helpful to disinfect the unsafe water. The institutions catering to the need of children, must be provided with protected water supply.

### Table 1: Estimation of vitamin A in children

<table>
<thead>
<tr>
<th>Days</th>
<th>Healthy children</th>
<th>Children with giardiasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>15.259, 0.58</td>
<td>11.888, 1.1</td>
</tr>
<tr>
<td>10</td>
<td>15.487, 1.1</td>
<td>11.116, 0.6</td>
</tr>
<tr>
<td>15</td>
<td>16.058, 1.4</td>
<td>10.244, 1.7</td>
</tr>
<tr>
<td>20</td>
<td>16.001, 0.7</td>
<td>9.777, 1.1</td>
</tr>
</tbody>
</table>

*Units are expressed as mg/100 ml serum and mean with SD statistically significant (P<0.05)*

### REFERENCES


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