



A DETAILED STUDY OF HYPEREOSINOPHILIA OR SEVERE EOSINOPHILIA IN PATIENTS WITH HOOKWORM INFECTION FOUND WHILE DOING UPPER GASTRO INTESTINAL ENDOSCOPY IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Objective: Eosinophilia occurs very commonly in hookworm infection. But so far detailed study was not done to know about the occurrence of hypereosinophilia in various grades of hookworm infection with or without anaemia. Hence a detailed study was done to know about the occurrence of hypereosinophilia in various grades of hookworm infection found in patients while doing upper gastro-intestinal endoscopy in our institute.

Methods: A study of 1259 patients who had undergone upper gastro-intestinal endoscopy for a period of 5 years from May 2009 to April 2014 was carried out in our institute. In each of these 1259 patients, the first and second part of duodenum were carefully examined to find out the presence of hookworms. In all the patients found to have hookworms in duodenum, investigations were done to know about the presence or absence of hypereosinophilia and anaemia except in the very few patients who were lost for follow up. The results were found as given below.

Results: Of these 1259 patients, as many as 18 patients were found to have hookworms in duodenum while doing upper gastro-intestinal endoscopy. Of these 18 patients, 4 patients were lost for follow up and full details about their investigations were not available. The remaining 14 patients were taken into consideration for our study. Of these 14 patients, as many as 10 patients were found to have eosinophilia (71%). Severe eosinophilia or hypereosinophilia was found in 4 out of 10 patients with eosinophilia (40%). 3 out of 4 patients with hypereosinophilia with hookworm infection in our study had anaemia, but one patient with hypereosinophilia did not have anaemia.

Conclusion: Hence, hypereosinophilia is an extremely important indicator of hookworm infection with or without anaemia. Hence upper gastro-intestinal endoscopy should be done to confirm the presence of hookworms in all patients with hypereosinophilia even when there is no anaemia in tropical and subtropical countries.

Key Words: Hypereosinophilia, Hookworm infection, Upper gastro-intestinal endoscopy.

INTRODUCTION

Eosinophilia occurs very commonly in hookworm infection (1 to 13). But so far detailed study was not done to know about the occurrence of hypereosinophilia in various grades of hookworm infection with or without anaemia. Hence a detailed study was done to know about the occurrence of hypereosinophilia in various grades of hookworm infection found in patients while doing upper gastro-intestinal endoscopy in our institute.

MATERIALS AND METHODS

This study was conducted in the department of general surgery, Aarupadai Veedu Medical College and Hospital, Puducherry. A study of 1259 patients who had undergone upper gastro-intestinal endoscopy in our institute for a period of 5 years from May 2009 to April 2014 was carried out. In each of these 1259 patients, the first and second part of duodenum were carefully examined to find out the presence of single or multiple hookworms. In all the patients found to have hookworms in

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duodenum, investigations were done to know about the presence of hypereosinophilia and anaemia except in the very few patients who were lost for follow up. Anaemia is defined as haemoglobin < 12g/dl or 12g% in women and haemoglobin < 13g/dl or 13g% in men. Mild anaemia is taken as haemoglobin 10 to 12g/dl or g%, moderate anaemia is taken as haemoglobin 7 to 10g/dl or g% and severe anaemia is taken as haemoglobin < 7g/dl or g%. Eosinophilia is defined as eosinophils > or = 500 cells/cu.mm (14). Severe eosinophilia or hypereosinophilia is defined as eosinophils > 1000 cells/cu.mm (4). The results were found as given below.

RESULTS

1. Of these 1259 patients, as many as 18 patients were found to have hookworms in duodenum while doing upper gastro-intestinal endoscopy.
2. Of these 18 patients, 4 patients were lost for follow up and full details about their investigations were not available. The remaining 14 patients were taken into consideration for our study.
3. Of these 14 patients, as many as 10 patients were found to have eosinophilia (71%).
4. Severe eosinophilia or hypereosinophilia was found in 4 out of 10 patients with eosinophilia (40%).
5. Of the 4 patients with hypereosinophilia or severe eosinophilia,
 - a. One patient did not have anaemia.
 - b. One patient had mild anaemia.
 - c. One patient had moderate anaemia.
 - d. One patient had severe anaemia.

Hence the 4 patients with hypereosinophilia or severe eosinophilia can be divided into 4 groups as follows

- a. Hypereosinophilia or severe eosinophilia without anaemia (1 patient).
- b. Hypereosinophilia or severe eosinophilia with mild anaemia (1 patient).
- c. Hypereosinophilia or severe eosinophilia with moderate anaemia (1 patient).
- d. Hypereosinophilia or severe eosinophilia with severe anaemia (1 patient).

a. Hypereosinophilia or severe eosinophilia without anaemia [1 patient]

1. One patient with hypereosinophilia with hookworm infection did not have anaemia (haemoglobin 18g%, absolute eosinophil count - 1000 cells/cu.mm) which is of extremely great significance.
2. This patient with hypereosinophilia had adequate amount of haemoglobin (18g%) indicating that there was only very minimal loss of blood due to very early stage of hookworm infection.

3. Thus hypereosinophilia or severe eosinophilia can be present when there is no anaemia due to very early stage of hookworm infection.
4. Hence hypereosinophilia or severe eosinophilia can be the earliest sign of hookworm infection and can be present in the very early stage of hookworm infection even before the onset of anaemia.

b. Hypereosinophilia or severe eosinophilia with mild anaemia [1 patient].

1. Hypereosinophilia or severe eosinophilia occurring along with mild anaemia was present in one patient in our study (haemoglobin 11.7g%, absolute eosinophil count - 1248 cells/cu.mm).
2. Multiple hookworms in duodenum with hypereosinophilia or severe eosinophilia [absolute eosinophil count - 1248 cells/cu.mm] and with mild anaemia (haemoglobin 11.7g%) seen in this patient indicating mild hookworm infection due to mild anaemia despite multiple hookworms is shown in Fig 1, 2.

c. Hypereosinophilia or severe eosinophilia with moderate anaemia [1 patient].

1. Hypereosinophilia or severe eosinophilia with moderate anaemia was present in one patient in our study (haemoglobin 8.6g%, absolute eosinophil count - 1260 cells/cu.mm).
2. Moderate anaemia is due to significant loss of blood due to more number of hookworms and is associated with stage of moderate hookworm infection.
3. One study has also shown the occurrence of moderate anaemia with hypereosinophilia or severe eosinophilia (15).

d. Hypereosinophilia or severe eosinophilia with severe anaemia [1 patient].

1. Severe anaemia is due to significant loss of blood due to large number of hookworms and very heavy burden of hookworm infection and indicates late stage of hookworm infection or stage of severe hookworm infection.
2. Hypereosinophilia or severe eosinophilia with severe anaemia was present in one patient in our study (haemoglobin 3.2g%, absolute eosinophil count - 1100 cells/cu.mm).
3. Multiple hookworms in duodenum with hypereosinophilia or severe eosinophilia (absolute eosinophil count - 1100 cells/cu.mm) and with severe anaemia (haemoglobin 3.2g%) indicating late stage of hookworm infection or stage of severe hookworm infection is shown in Fig 3, 4.
4. Other studies have also shown the occurrence of severe anaemia with hypereosinophilia or severe eosinophilia (2, 9, 13, 22).

5. But stool examination was negative for hookworm ova in this patient despite heavy burden of hookworm infection with severe anaemia. Many studies have also shown negative stool examination for hookworm ova despite heavy burden of hookworm infection with severe anaemia (1, 9, 13, 16 to 22).
6. Hypereosinophilia or severe eosinophilia persisted in this patient throughout the period of 6 months despite her improvement of haemoglobin to 9.2g% and negative stool examination for hookworm ova .
7. This is of extremely great significance since persistent hypereosinophilia or severe eosinophilia was the only indicator of hookworm infection due to which upper gastro-intestinal endoscopy was done and hookworm infection was confirmed in this patient.

DISCUSSION

Persistent hypereosinophilia helping in the diagnosis of hookworm infection which was greatly delayed due to persistent negative stool examination for hookworm ova

In this female patient with severe anaemia and hypereosinophilia or severe eosinophilia (hemoglobin 3.2g%, absolute eosinophil count - 1100 cells/cu.mm) , upper gastro intestinal endoscopy was done only after 6 months of the initial presentation since repeated stool examination done in these 6 months were persistently negative for hookworm ova in this patient.

At her initial admission , despite severe anaemia and hypereosinophilia, upper gastro intestinal endoscopy was not done since the stool examination was negative for hookworm ova. She was treated with two pints of blood transfusion and haematinics and her haemoglobin improved significantly to 9.2g% after 6 months. But stool examination was again negative for hookworm ova even after 6 months. But despite her improved haemoglobin of 9.2g% and persistent negative stool examination for hookworm ova, her hypereosinophilia or severe eosinophilia(absolute eosinophil count >1000 cells/cu.mm) never resolved and persisted throughout this period of 6 months.

Due to the persistent severe eosinophilia or hypereosinophilia, upper gastro intestinal endoscopy was finally done and the diagnosis of hookworm infection was finally made after a delay of 6 months which occurred due to the persistent negative stool examination for hookworm ova.

Hence upper gastro-intestinal endoscopy should always be done in all patients with hypereosinophilia to confirm

the presence of hookworms in tropical and subtropical countries even when there is no anaemia and even when stool examination is negative for hookworm ova. The diagnosis of hookworm infection was completely missed at her initial admission since upper gastro-intestinal endoscopy was not done due to the negative stool examination for hookworm ova. Hence stool examination should never be considered as a single diagnostic criterion to diagnose hookworm infection.

CONCLUSION

Severe eosinophilia or hypereosinophilia was found in 40% of our patients indicating that significant number of patients with hookworm infection had very high eosinophil count. Hypereosinophilia or severe eosinophilia can be the earliest sign of hookworm infection and can be present in the very early stage of hookworm infection even before the onset of anaemia. Hypereosinophilia or severe eosinophilia can also be present in the late stage of hookworm infection with severe anaemia.

In the female patient with severe anaemia due to severe hookworm infection with hypereosinophilia or severe eosinophilia with multiple hookworms in duodenum, stool examination was negative for hookworm ova. But, hypereosinophilia or severe eosinophilia persisted in this patient throughout the period of 6 months despite her improvement of haemoglobin to 9.2g% and negative stool examination for hookworm ova. This is of extremely great significance since persistent hypereosinophilia or severe eosinophilia was the only indicator of hookworm infection due to which upper gastro-intestinal endoscopy was done and hookworm infection was confirmed in this patient.

Hence upper gastro-intestinal endoscopy should always be done in all patients with hypereosinophilia to confirm the presence of hookworms in tropical and subtropical countries even when there is no anaemia and even when stool examination is negative for hookworm ova.

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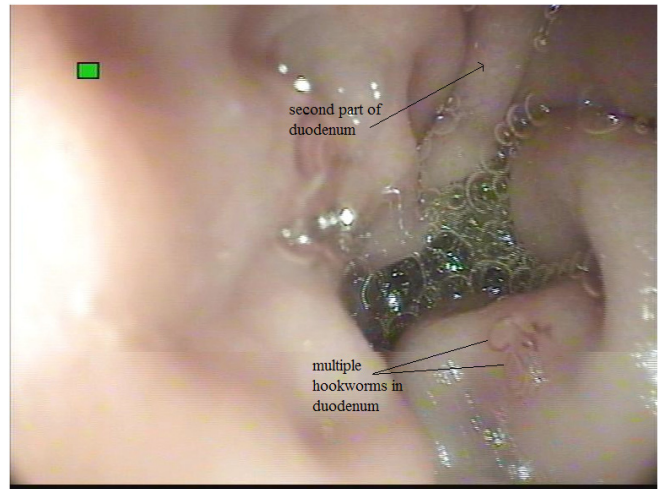


Figure 1: Multiple hookworms in duodenum with hypereosinophilia [absolute eosinophil count - 1248cells/cu.mm] and with mild anaemia [haemoglobin 11.7g %] .

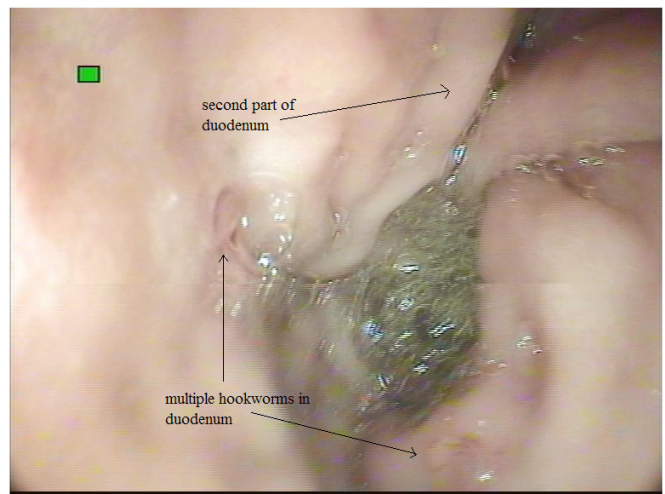


Figure 2: Multiple hookworms in duodenum with hypereosinophilia and with mild anaemia in the same patient [different view] .

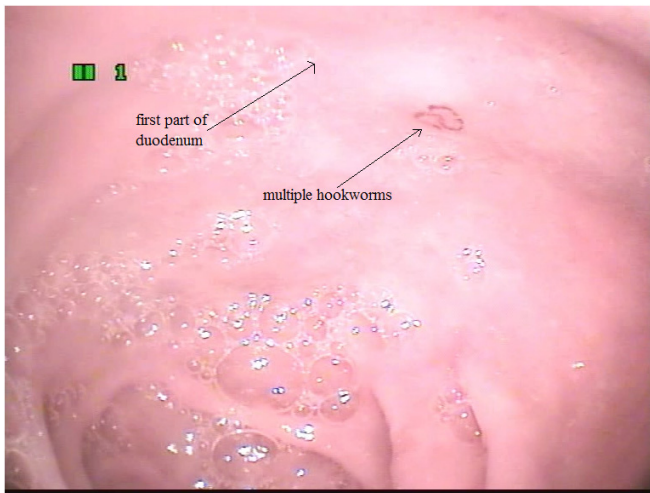


Figure 3: Multiple hookworms in duodenum with hypereosinophilia [absolute eosinophil count - 1100cells/cu.mm] and with severe anaemia [haemoglobin 3.2 g%].

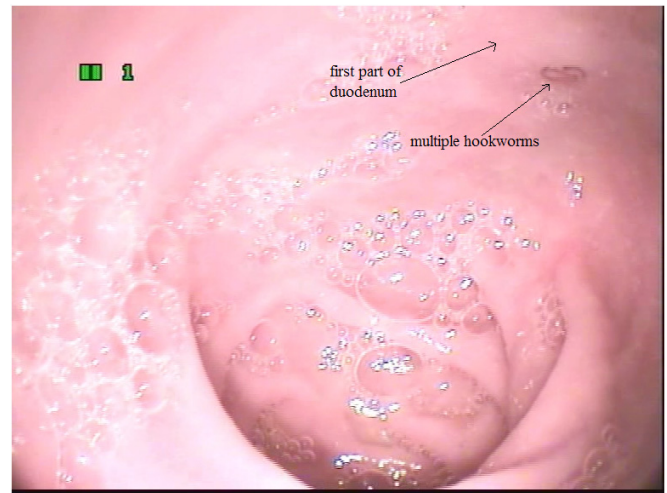


Figure 4: Multiple hookworms in duodenum with hypereosinophilia and with severe anaemia in the same patient [different view] .