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Case Report

Disseminated Strongyloidiasis in an Immunodeficient Patient (Pemphigus Vulgaris) Due to Corticosteroid Therapy: A Case Report

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Abstract
Strongyloidiasis is a frequent misdiagnosed parasitic infection in the world that caused by *Strongyloides stercoralis*. In Iran, the disease is predominantly reported from warm and humid climate provinces. The patient was a 54-yr-old man, originated from Khuzestan Province with a history of pemphigus and diabetes that was treated with high-dose of corticosteroid drugs before admission in a non-private hospital in Shiraz, Iran in 2014. After different primary diagnosis and administrating of several drugs, endoscopy and histopatholgical biopsy revealed a massive *S. stercoralis* infection in the duodenal mucosa and gastric wall. In spite treating with anti-helminthic drugs in the last days, due to using different steroid drugs, clinical manifestations of the patient were exacerbated and he was expired on the seventeenth day due to severe dyspnea. Physicians' awareness and using various diagnosis methods like serology, endoscopy, and biopsy should be considered in the endemic areas. In suspicious cases, anthelmintic drugs should be started before the initiation of immunosuppressive therapy.

Introduction

Strongyloidiasis is a parasitic infection caused by a tiny nematode called *Strongyloides stercoralis*. It is presently known as frequently misdiagnosed nematode and the most forgotten tropical disease in human throughout the world (1, 2). About ten mil-

lions of persons are infected worldwide (3, 4). In Iran, the disease is predominantly scattered and reported in warm and humid climate provinces, including Mazandaran and Guilan in the north, Khuzestan in the southwest and Hormozgan in the south. The environmental conditions of these provinces are suitable for transferring and growing of the parasite (5-8). There are both free-living and parasitic stages in the life cycle of this parasite. Under certain conditions of host immunity, especially, in immunocompromised patients with deficiency in cell-mediated immunity, this disease could be fatal. Nowadays, with increasing numbers of immunosuppressed patients in the world, risk for *S. stercoralis* infection in mentioned individuals should be at more attention. Physician awareness should be emphasized especially, in the endemic areas (3).

This study aimed to following and highlighting the manifestations that appear in an immunodeficient patient (pemphigus and diabetes) who administrated corticosteroid therapy when hidden gastrointestinal strongyloidiasis present as well.

Case presentation

The patient was a 54-yr-old, an Iranian man admitted to a non-private hospital in Shiraz on Aug 2014. His main complaints were abdominal pain, vomiting, diarrhea, headache and hematemesis. The epigastric pain was started from 20 days before. On admission, vital signs were as below: blood pressure 100/60 mmHg, pulse rate 90/min, respiratory rate, and PO_2 were 20/min and 95%, respectively while body temperature was 37.5 ℃. According to his history, he was hospitalized six months ago due to lesions and blisters in the mouth and rashes on his trunk skin with a slight itch. He also had some episodes of abdominal pain. After 44 days, he was discharged from hospital while he was diagnosed as pemphigus vulgaris and diabetes.

In a survey in his lab records, appeared a cortisol test >600 micg/d (94.1-260.6 micg/d) while ACTH has been 24.7 ng/ml (8.3-57.8 ng/ml). In addition, he has been a thalassemia minor case because of an MCV 63.2 fL (77-95 fL) and elevated HbA_2:5.2% (1-3.5%). Furthermore, his HIV and hepatitis panel were found negative. Newest lab report in time of admission showed a brief elevation of amylase and lipase as 180 IU/L (0-100 IU/L) and 200 IU/L (10–140 IU/L), respectively. LDH was soared from 334 to 1240 IU/L (less than 450 IU/L). Liver function tests were nearly normal however, ALK showed an elevation around 173 IU/L (40-129 IU/L) similarly, AST and ALT had elevated gradually. The hematological indexes showed a microcytic hypochromic anemia with a low value of HCT and Hb. WBC were normal while, no high eosinophilia in his peripheral blood was reported. ESR had changed from 5-20 however; CRP showed marked elevation value. Simple chest X-ray in arrival showed marginal shadow in both lungs (Fig. 1).

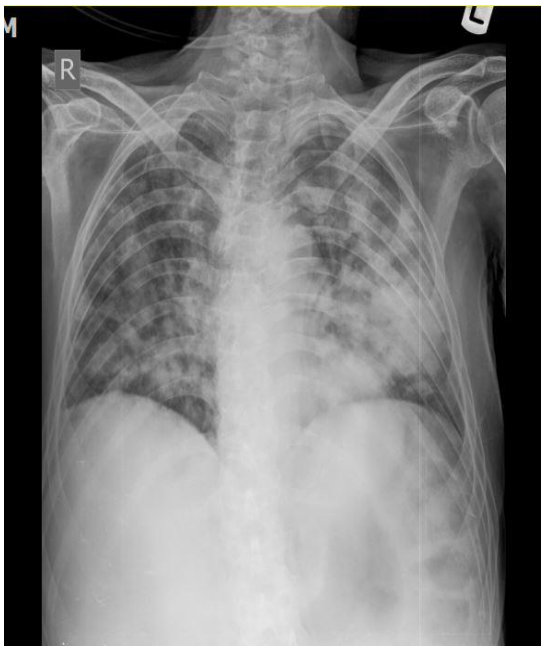

Fig. 1: Simple chest X-ray in arrival showed marginal shadow in both lungs

Gastric track endoscopy revealed erosion on greater curvature and antrum. Hypo echo lesions in liver found by sonography, however, later on CT scan ruled out as a fat mass structure. Biochemistry finding showed variability in electrolytes (Na & K) with 128 to 135 mEq/L (135-145 mEq/L) and 2.9 to 4.2 mEq/L (3.5-5.0 mEq/L), respectively, while albumin level has fallen from 2.5 to 1.8 g/dl (3.5-5.5 g/dl). The patient had complained of constipation and no stool examination was taken. Blood gas report in ICU showed respiratory alkalosis pH=7.425 nmol/L (7.35-7.45 nmol/L), PCO2= 23.7 mm Hg (33-45 mm Hg) and PO2=41.7 mm Hg (75-105 mm Hg).

Regarding above findings, different primary diagnoses suggested to the patient on arrival were pancreatitis, adrenal insufficiency and lung cancer. Therefore, some medications prescribe as follow at arrival: a mild dose of prednisolon, aziathioprine, and omprazol. His blood glucose was controlled by 4IU insulin regularly. However, other drugs and antibiotics including amicasin, meropenem, ampicilin, cotrimoxazol were administrated in the next days in consulting with different specialists as dermatologist, cardiologist, neurologist and endocrinologist. Patient endoscopy on day 7, showed erosion on greater curvature and antrum while, histopatholgical biopsy examination showed a transmural inflammation with noticeable infiltration of eosinophils, histocytes and plasma cells between layers of the bowel in sub mucosa where the infiltration of eosinophils was most evident. Massive *S. stercoralis* infection in the duodenal mucosa and gastric wall were seen. The presence of adult females, eggs, and larvae were notable (Fig. 2).

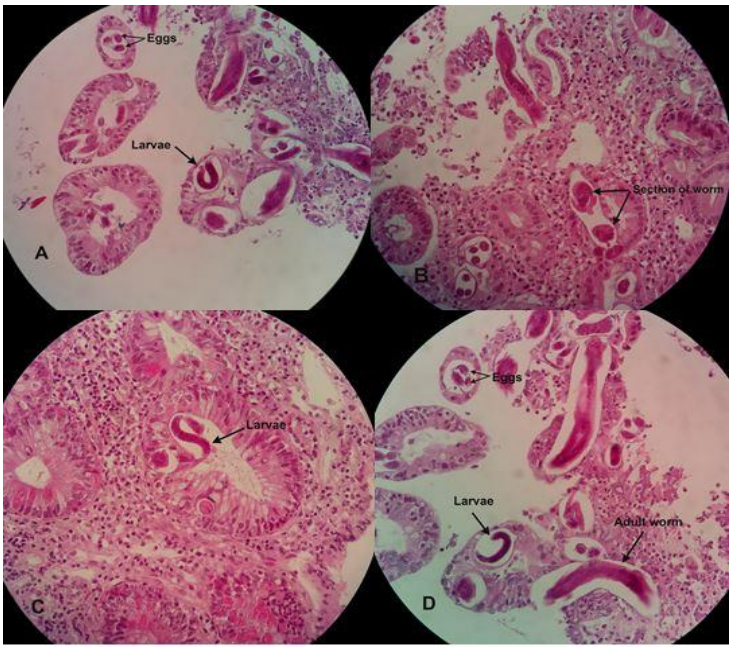

Fig. 2: A case of gastric strongyloidiasis diagnosed by pathological sectioning of intestine tissue, original picture (H&E staining)
A. The eggs and larvae of *Strongyloides* have been shown
B. Cross-section of *Strongyloides* parasite
C. A larvae of *Strongyloides* in the center and high eosinophilia is noticeable
D. A Section of adult worms, larvae and eggs are arrowed

Other evidences in his file confirm the fatal hyperinfection syndrome due to strongyloidiasis as well. Furthermore, he has been confirmed later as a case of strongyloidiasis in about 6 months ago that was hospitalized in Ahwaz, an endemic area for this infection (6, 8). Albendazol as an effective drug was used to treat the patient at that time (9, 10). Regarding the patient temperature sheet, he was at a hypothermic condition during hospitalization. The respiratory rate was less and more around 20/min meanwhile; it has been shown that there are fluctuations in pulse rate during of hospitalization period (Fig. 3). In day 16, he prescribed acyclovir 400 mg IV as antiviral drug. Due to using different steroid drugs, clinical manifestations of the patient were exacerbated subsequently. On day 17 of hospitalization, patient faced with dyspnea and were transferred to ICU. Finally, despite the efforts of CPR team and adrenaline injection, the patient was expired in the last hours of the seventeenth day. Final diagnosis appeared in his file had been diabetes.

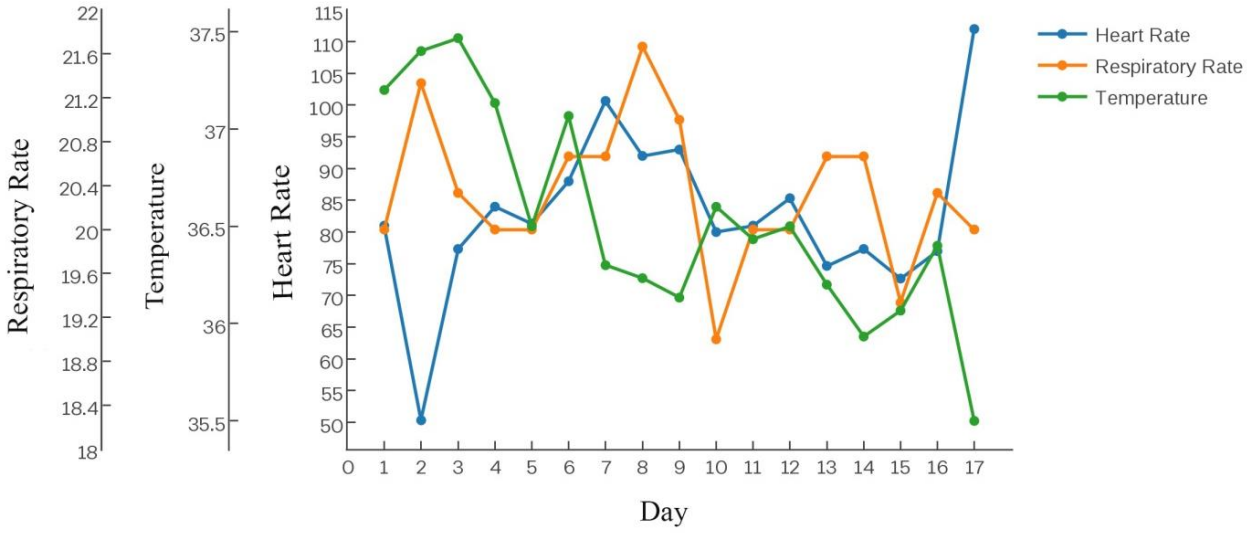

Fig. 3: The condition of temperature, respiratory rate and heart rate of the patient followed in 17 days

Discussion

Firstly, it must be emphasized that the patient history should be more considered by physicians, especially in immunodeficiency disorders like pemphigus vulgaris, lupus, lymphoma, and rheumatoid arthritis (11-13). As it appears from his history, like some studies (12), physician after examination and checking his last laboratory and chest X-ray results put his early diagnosis on lung cancer, adrenal insufficiency and diabetes while, he diagnosed previously for pemphigus vulgaris. On the fifteenth day of hospitalization, regarding of his constipation, cramp, abdominal pain, bloating, weight loss, vomiting, anorexia, hematemesis and nausea, the gastrointestinal endoscopy and biopsy were ordered by the physician. Cited symptoms have been reported frequently in other investigations (14-19). Likewise, pulmonary manifestations such as chest pain, wheezing, cough, palpitations, atrial fibrillation and dyspnea were present (20, 21). Despite hematemesis, no sputum examination ordered for parasites.

Moreover, in our case soaring of rashes and reddish has been reported by nurses. Also in other similar studies, electrolyte disturbance, albumin deficiency, persistence alkalosis and high levels of endogenous cortisol have been

reported that concord with the patient results (21). These elevated levels of endogenous corticosteroids could stimulate parasite fecundity and differentiation into filariform larvae, so autoinfection and hyperinfection induced (22). Furthermore, abnormal liver enzyme pattern elevation could be induced by hyperinfection in immunodeficiency patients as well described before. This condition mimics enzymes pattern elevation in pancreatitis (21).

Administration of acyclovir as an antiviral for prophylaxis, could accelerate the malignancy of strongyloidiasis (23) but, prescribed in sixteen day for this patient. Other drugs have contributed to an immunosuppressive condition related with hyperinfection has been pointed as well (20). The ignorance of strongyloidiasis manifestations may be due to the unfamiliarity of physicians to this kind of infection (24). In this case, no anti-helminthic medication was administered until the last days.

In complicated patients, it has been noted and stressed that endoscopy and biopsy are very useful tools for confirmation of gastrointestinal strongyloidiasis (25). Otherwise, a prophylaxis with ivermectin as a standard dose should be administered in admission to all immunocompromised patients, especially in endemic areas. Due to constipation, stool sample was not available for detection of the parasite in these patients but, investigation of parasites in sputum is a very simple, cost effective, none invasive and available method. Serological tests could not be helpful for diagnosis because of cross-reactions with two important families of human helminthes, Ascaridae and Filarioidea (21, 26).

It is mentioned that *S. stercoralis* larvae act as a shuttle; so many enteric bacteria could be transferred from intestine to other Organs (19). Obviously, a great deal of gram-negative bacteria and their endotoxins became widespread into vital tissues, causing toxic shock and lead to death in these patients. Finally, it strongly emphasized that hyperinfection cases are infectious sources for health workers and should be isolated in a separated room.

Conclusion

Physicians' awareness, using diagnosis methods including serology, as screening and endoscopy with biopsy as confirmation, should be more considered in the endemic areas. Misdiagnosis of this kind of patients can lead to disastrous outcome and should be regard as hospital infections. All immunocompromised patients who dwell or travel to the endemic areas should be investigated for strongyloidiasis. In suspicious patients, anthelmintic drugs should be started before the initiation of immunosuppressive therapy.

Acknowledgments

The authors declare that there is no conflict of interests.

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