Rhabditiform and Filariform Larvae of Strongyloides Stercoralis in Sputum Cytology


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A case of Strongyloides stercoralis infection found incidentally in the sputum cytology is reported. Numerous number of both rhabditiform and filariform larvae were detected. The patient had been under a debilitating condition and getting treatment for silicosis, gastric cancer and tuberculosis. The presence of numerous larvae was considered to be an autoinfection unique to this parasite.

Key words: Lung—Sputum cytology—Strongyloidiasis—Autoinfection

Strongyloides stercoralis is a parasite of the small intestine. However, during their life cycle, the rhabditiform and filariform larvae reach the lung and may be detected in the sputum cytology1)−3). While the filariform larvae penetrates the skin to enter the circulation and reaches the lung, the rhabditiform larvae reach the lung by the way of autoinfection4)−5).

We report here a case of Strongyloides stercoralis infection in which numerous number of both rhabditiform and filariform larvae were detected unexpectedly in the sputum cytology.

Report of a case

A 64-year-old plasterer was admitted to a hospital for evaluation of dyspnea and cough with sputum. The patient was from Saeki city, Ohita which is mainly an agricultural area and the geoclimatic conditions are warm and humid. He had been working under a dust-full environment over 20 years period. He was diagnosed as a case of silicosis with secondary bronchiolitis on January 31, 1981. Antibiotics were administrated at that time. On March 19, 1981, early gastric cancer was detected and total gastrectomy was done. In May 1981 tuberculosis was associated. Streptomycin, isoniazid and RFP were administrated. In January 1982, the patient was admitted. Laboratory exami-
nation on this admission revealed anemia, eosinophilia and elevated sedimentation rate. Chest X-ray showed abnormal shadows in both lungs, particularly in the right lung. Sputum cytology was undertaken and numerous larvae of Strongyloides stercoralis were observed. Anti-parasitic therapy was not done because the patient was died shortly thereafter. Stool specimens were examined twice, but no parasites were detected. An attempt was not made to culture the feces. Therefore, the possibility of false negative could not be denied. An autopsy was not performed. The patient did not receive corticosteroids or other immunosuppressive agents throughout the course.

A routine sputum cytology revealed 92 larvae consisting of 26 non-infective rhabditiforms and 66 infective filariforms in one Papanicolaou staining slide (24×50 mm). A rhabditiform larva which was 250–280 um in length, had esophagus bulb, large reproductive organs and a relatively short, but pointed tail (Fig. la). A filariform larva which was 520–600 um in length, had a long esophagus, small reproductive organs and the diagnostic notch at the end of its long tail (Fig. lb). These larvae were mainly orangeophilic. Background showed acute or chronic inflammatory cells and cell debris.

Discussion

The life cycle of strongyloides stercoralis begins with the infective filariform larvae penetrating the skin of the host. These larvae enter the venous circulation and migrate through the right heart to the lungs, where they break through the capillaries into the alveoli. They develop there into adolescent worms which are swallowed with the expectorated sputum and reach the proximal part of the small intestine, where the adult worm burrows into the intestinal mucosa and begins to lay eggs. Only non-infective rhabditiform larvae are derived from the eggs and found in the feces. These larvae are eliminated with intestinal contents to finally develop into infective filariform larvae outside the body. These infective larvae are then able to infect another host through the skin. In addition to this typical life cycle of the parasite, Strongyloides has also an endogenous cycle which is unique to this nematode known as an autoinfection. Under certain circumstances, when the elimina-
tion of the non-infective rhabditiform larvae with the feces is delayed, these larvae may develop into infective filariform larvae within the body of the host. These may then reinfect the host by penetrating the intestinal mucosa or the perianal skin, thus establishing an endogenous cycle within the host. Some such autoinfection can be severe and fatal. The autoinfection is apparently increasing as the use of chemotherapeutic agents, corticosteroids and immunosuppressive drugs increases.

Generally, the details of the internal morphology are not as readily identified in the Papanicolaou stained preparation as in the wet mounts of stool specimens. The rhabditiform larvae are shorter than the filariform larvae. The filariform larvae are slender and have the prominent esophagus extending one-half the body length and the reproductive organs. The notched tail is diagnostic of the filariform larva, but is visible only on selective focussing.

In our case, both the rhabditiform and filariform larvae were found in excessive numbers. The filariform larvae were thought to be the result of autoinfection. But the presence of rhabditiform larvae suggests that adult worm could infest in the lung heterotopically. The patient had been treated for pneumoconiosis, and had gastric cancer and tuberculosis. Namely, the patient is considered to be under debilitated condition. Therefore, the heterotopic infection and autoinfection of Strongyloides stercoralis are occurred. The stool examination was performed twice, but it did not demonstrate the parasites. Because this method of diagnosis is not sensitive, the fact that they are negative does not necessarily indicate that parasites are not present. Routine sputum cytology is thought to be useful for this rare parasite autoinfection found in the patient under debilitating condition such as cancer or chronic diseases.

要約

線虫症を喀痰細胞診で偶然診断した1症例を報告した。ラブジチス型とフィラリア型の両方の幼虫が多数喀痰中にみられた。患者は肺結核、胃癌で治療中の免疫機能の低下した状態にあった。多くの線虫幼虫が肺にみられたのは、この寄生虫に特有の自家感染によるものと考えられた。

References