

EFFECT OF BERBERINE ON GIARDIASIS

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ABSTRACT : *Giardia* is one of a protozoal parasites that infect the upper small intestine of mammals and causes intestinal symptoms such as abdominal pains, chronic diarrhea, malabsorption of the fats and weight loss, this parasite spread in world wide and infect all ages especially poor communities. There are many herbs that use to treat *Giardia* such as berberine is a plant alkaloid use in traditional Chinese and indigenous Indian medicine dating back at least 3,000 years, it's produced by herbs *Coptis chinensis*, *Berberis aquifolium*, *Hydrastis canadensis*, *Berberis aristata*, *Berberis vulgaris*. Berberine has proved antimicrobial activity against protozoan.

Key words : Berberine, herbs, protozoan, chronic diarrhea, weight loss.

INTRODUCTION

Giardia lamblia was first described by Antonie Van Leeuwenhoek in 1681 when observed this parasite in his own of diarrheic stools (Gillin *et al*, 1996).

Giardiasis is one of the most common parasitic diseases that infect of humans, it's widely distributed around the world in industrialized and developing countries (Eckmann and Gillin, 2001).

Giardiasis found in two forms during the life cycle: the trophozoite and the cyst, trophozoite is the vegetative form of *Giardia* that infect the gastrointestinal tract and cause many symptoms (Adam, 2001).

The trophozoite is pyriform shaped, the front end is round and the background is pointed. It measures 4µm thick and 15µm × 9µm wide, and contain one pair of nuclei, four pairs of flagella, one pair of axostyles and sucking disc, which helps in its adhesion to the mucous layer of the intestine (Paniker, 2013). The Cyst is the form responsible for the transmission of infection to humans, it's excreted with the feces from an infected host, this disease is transmitted to humans during the ingestion of water and food contaminated with cysts or via direct fecal oral contact (Perez *et al*, 2001), the cyst is small and oval, measuring 12µm × 8µm and surrounded by a hyaline cyst wall, it's contains 2 pairs of nuclei grouped at one end, a young cyst contains 1 pair of nuclei, in the young cyst may be seen residue the flagella and the sucking disc (Paniker, 2013).

Life cycle

The infection occurs when ingestion non motile cysts in water and food contaminated or from another person due to lack of interest in personal hygiene, starting the process of excystation when exposed to gastric acid in the host's stomach and the exit process continues until reaching to the upper small intestine, where the cyst burst and gives excyzoite, which is differentiated into vegetative form and divided twice without DNA multiplication to gives rise four trophozoites during 15 minutes each characterized by containing two diploid nuclei (Syard *et al*, 2003; Ankarklev *et al*, 2010). Excystation is induced when exposed to host different factors such as high levels of bile, low levels of cholesterol and pH when reaches to the lower small intestine two stages can be distinguished in the process Excystation.

In the first stage, the trophozoite round up and encystation and become particular vesicles apparent and proteins of the cyst wall transport to the cyst wall, the adhesive disc is divided into four crescent structures that are reservation in the cytoplasm and the late encystation the nuclei divide and give four nuclei (diploid) and the DNA is doubles more than once and each cyst contain four nuclei. The trophozoites have a higher metabolic rate than the cysts and the cysts more resistant to an environmental factors outside the host (Ankarklev, 2010).

Pathogenicity

The parasit's pathogenicity depend on many factors