



**KULLIYAH OF MEDICINE & HEALTH SCIENCES**  
(Student's copy)

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| Course             | Medical Parasitology  |
| Semester/Year      | 3/ 2  |
| Topic              | Intestinal & luminal protozoa II: <i>Blastocystis hominis</i> |
| Date               |   |
| Time               |   |
| Student's Name/ ID |   |
| Lecturer Name      | Lee Ii Li   |

### **Overview**

This is the Self-Learning Package (SLP) for Medical Parasitology (MP). The exercise will help students to understand the biology, diagnosis, treatment and prevention and control measures for *Blastocystis hominis*.

*Blastocystis* spp. is a common microscopic organism that inhabits the intestine and is found throughout the world. It is a polymorphic organism. *B. hominis* appear as spherical to oval cyst-like structures. They vary widely in size (5 to 30  $\mu\text{m}$ ; usual range 8 to 10  $\mu\text{m}$ ), and typically consist of a central body, or "vacuole," surrounded by a thin rim of cytoplasm containing up to six nuclei. The vacuoles stain variably from red to blue in trichrome stain, which is preferred to wet mounts as the organisms can be overlooked as debris.

Several studies have proposed life cycles for *B. hominis* but to date its life cycle is still under investigation and therefore remains inconclusive. Nonetheless, at this juncture, Centres for Disease Control and Prevention (CDC) has adopted the life cycle proposed by Singh and co-workers in 1995.

Cyst form of *Blastocystis* sp. is often believed to be found in faeces. The thick-walled cysts excreted in the faeces are believed to be responsible for transmission by the faecal-oral

route, particularly through ingestion of contaminated water, food or possibly due to poor hand hygiene. The ingested cysts will infect epithelial cells of the digestive tract, develop into vacuolar forms and multiply asexually through binary fission. Vacuolar forms will then differentiate to multi-vacuolar and amoeboid forms. Multi-vacuolar forms develop into pre-cysts that develop into thin-walled cysts, which are responsible for autoinfection. Amoeboid forms give rise to pre-cysts that develop into thick-walled cysts by schizogony, which are excreted in faeces.

Whether *B. hominis* can cause symptomatic infection in humans is a point of active debate. This is because of the common occurrence of the organism in both asymptomatic and symptomatic persons. Those who believe symptoms could be related to infection with this parasite have described a spectrum of illness.

Signs and symptoms attributed to blastocystosis are often nonspecific and are common to other infections. Since the symptoms are nonspecific many clinicians may overlook blastocystosis, and misdiagnose the condition of a patient. This may lead to under reporting of the disease.

Many treatment regimens had been designed to treat blastocystosis in the past, some dated as far back as more than 20 years ago. Despite the controversial clinical significance of this organism, metronidazole or iodoquinol has been reported to be effective.

Treatment with **metronidazole** at various doses has been reported, for example (adults):

- 250 mg to 750 mg metronidazole orally 3 times daily for 10 days
- 1500 mg metronidazole orally once daily for 10 days

It is important to address the risk factors as mentioned in section 1.3.6 that contribute to the transmission of *Blastocystis* sp. in order to reduce if not eliminate its transmission. Therefore, it is important to uphold and practise hand hygiene, which is to wash hands before meals, after using toilet, after contact with animals and any surface that is unclean.

**Topic Learning Outcomes (TLOs)**

Students should be able to:

1. Enlist the characteristics of *Blastocystis hominis* and to differentiate all forms of the parasite
2. Describe the life cycle of *B. Hominis*
3. Enumerate the clinical features of blastocystosis
4. Name the treatment for blastocystosis
5. Enlist the prevention and control measures for blastocystosis

References:

1. Franklin A.N. & Harold W. (1998). **Basic and Clinical Parasitology** (6<sup>th</sup> Edition) New York Prentice Hall.
2. Viqar, Z., & Loh, A.K. (1996) **Handbook of Medical Parasitology** (3<sup>rd</sup> Edition).
3. Centers for Disease Control and Prevention.  
<http://www.cdc.gov/parasites/blastocystis/>

Using the references provided and other possible resource materials in the library, answer the following questions.

1. Enlist the characteristics of four common forms of *Blastocystis hominis* and draw its morphology.

| Forms/ Size (µm)       | Characteristics      | Morphology |
|------------------------|----------------------|------------|
| Cystic<br>2 to 5 µm    | 1.<br>2.<br>3.<br>4. |            |
| Vacuolar<br>2 – 200 µm | 1.<br>2.<br>3.       |            |

|          |              |  |
|----------|--------------|--|
| Granular | 1.<br><br>2. |  |
| Amoebic  | 1.<br><br>2. |  |

2. Name **TWO (2)** other less frequently encountered forms.

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3. Enlist **FOUR (4)** diagnostic methods to identify the parasite.

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4. Draw and describe the life cycle of *B. hominis*.

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5. Enlist **FOUR (4)** possible modes of transmission associated with blastocystosis.

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6. Enumerate **FIVE (5)** risk factors associated with blastocystosis.

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7. Enlist **FIVE (5)** signs and symptoms of blastocystosis.

1.

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2.

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8. Name **TWO (2)** other drugs that may improve symptoms of a patient infected by *B. hominis*.

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9. Name **FOUR (4)** other possible prevention or control measures.

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