Medical Biotechnology 2018

Biological therapies

Lecture 25-26th

Treatment with living organisms.

Zootherapy using maggot, larva, leaches, honey bee.

Theroretical background

Immunomodulatory effect of infections:

- Viral infections
- Bacterial infections
- Parasitic infections

Antigen induced defence mechanisms responsible for eliminating pathogens are modifying the local and systemic immune response, and this modification is not antigen specific.

Zootherapy

- The zootherapy is a **technique that involves the animals** in the diagnosis, prevention and treatment of human pathologies, as much physical, mental, psychological and spiritual.

Physico- and psicho-therapy with animals

Fish Spa Therapy

- ***Garra rufa*** (nicknames: nibble fish, kangal fish, physio fish, doctorfishen) occurs in the river basins of the Northern and Central Middle East, mainly in Turkey, Syria, Iraq and Iran.
- Non-medical – cosmetical applications
- Complementary treatment in **psoriasis**

Larval therapy

- **Maggot therapy** (also known as **maggot debridement therapy (MDT)**, **larval therapy**, **larva therapy**, **larvae therapy**, **biodebridement** or **biosurgery**) is a type of biotherapy involving the intentional introduction of live, disinfected maggots (fly larvae) into the non-healing skin and soft tissue wounds of a human or animal for the purpose of cleaning out the necrotic tissue within a wound (debridement) and disinfection. This therapeutic procedure was used from the ancient ages to the WW I. in surgery.


Medical Maggots
MONARCH LABS

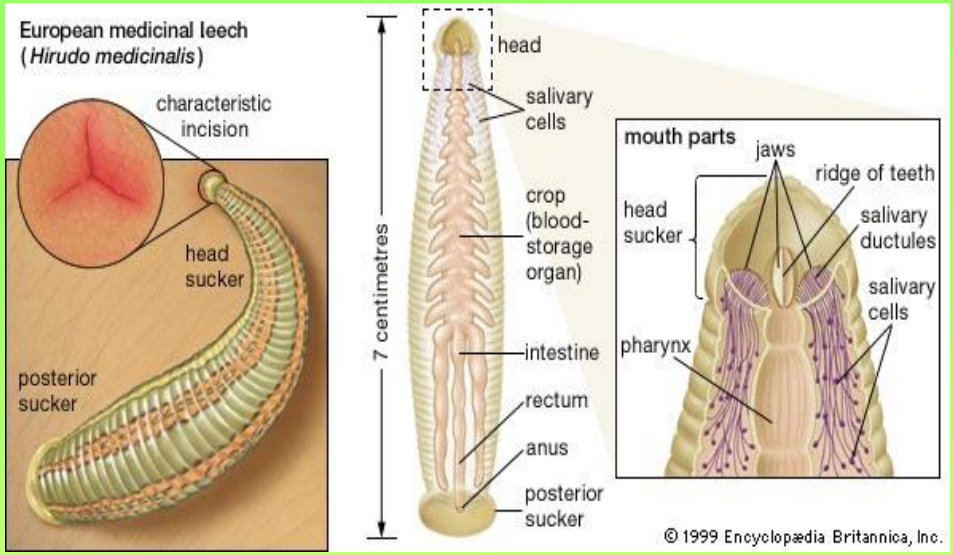
Bee venom therapy

- Bee venom has been used via bee-sting therapy for centuries in many cultures. Hippocrates and Confucius were familiar with its healing properties, and commonly used today in China and India for treat autoimmune diseases, chronic pain, rheumatoid arthritis, etc.
- **Honey Bee Therapy** (also known as bee sting therapy or apitherapy, involves the injection of honey bee venom subcutaneously, either naturally (using the honey bee and its sting), or artificially (injecting the venom extracts via syringe).
- Honey bee venom contains **anti-inflammatory** substances that are believed to be responsible for the beneficial effects seen when they are allowed to sting patients with severe pain syndromes (for example, rheumatoid arthritis), and some neurological syndromes (for example, multiple sclerosis).

Complications: sever (sometimes lethal) allergy, infections

Hirudotherapy with medicinal leeches

- Medicinal leeches are any of several species of leeches, but most commonly ***Hirudo medicinalis***, the European medicinal leech.
- In medieval and early modern medicine, the medicinal leech was used to remove blood from a patient as part of a process to "balance" the "humors" that, according to ***Galen***, must be kept in balance for the human body to function properly.
- Medicinal leeches are now making a comeback in *microsurgery*, by reduce blood coagulation, to relieve venous pressure from pooling blood (venous insufficiency), and in *reconstructive surgery* to stimulate circulation in reattachment operations for organs with critical blood flow, such as eyelids, fingers, and ears.

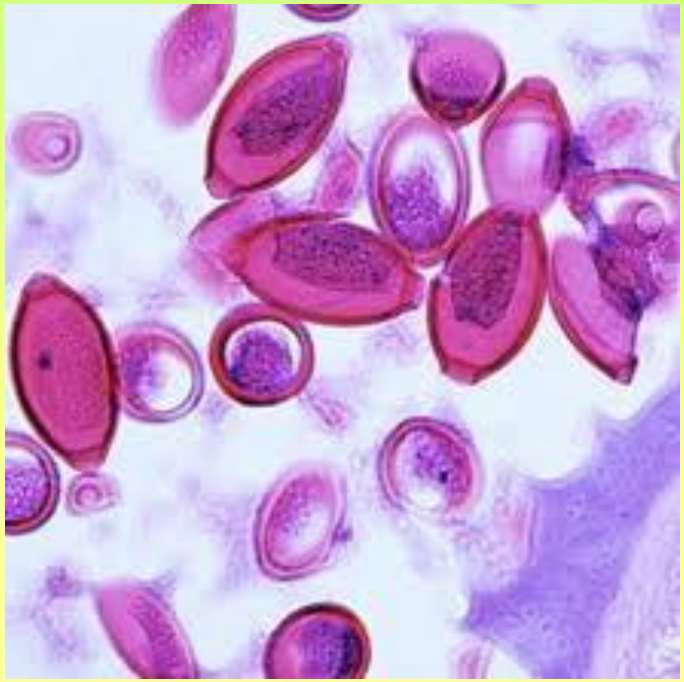


Madam Fatimah undergoing leech therapy for her swollen foot at her flat in Sembawang recently. "Before this, my foot was like an elephant's," she said. ST PHOTO: TEH JOO LIN

The most common complication from leech treatment is prolonged bleeding, although allergic reactions and bacterial infections may also occur.

Helminth induced immune regulation

- The introduction of small doses of **intestinal worms** may be effective in the treatment of Crohn's disease, ulcerative colitis, inflammatory bowel disease (IBD), multiple sclerosis, asthma, eczema, dermatitis, hay fever and food allergies.
- Lack of exposure to sufficient benign antigens, including intestinal worm infections, particularly during childhood, is sometimes suggested as a cause of the increase in autoimmune diseases and diseases for which chronic inflammation is a major component in the industrialized world.
- Inoculation with *Necator americanus*, commonly known as hookworms, or *Trichuris suis* ova (TSO), commonly known as pig whipworm eggs, or inoculation with *Trichuris trichiura* ova, commonly referred to as human whipworm eggs.



Evidence based studies are required in all zootreapeutic procedures. If they are positive we can use them as complementary treatments.