

3-Avian Toxoplasmosis

***Definition:** It is a **zoonotic protozoal** parasitic disorder of mammals, **birds**, and reptiles affecting primarily the **central nervous system** but sometimes also the reproductive system, skeletal muscles, and **visceral organs**.

***Etiology:** caused by Toxoplasma gondii.

***Pathogenesis & Epidemiology:-**

1-Infective oocysts of *T. gondii* are **produced** only by members of the **Felidae (Cat Family)**.

2-More than 63 species of **birds** and **27 species** of other animals become infected from **ingestion of oocysts** and develop **cysts** in tissues without passing oocysts in the feces.

3-Naturally occurring infections have been diagnosed in the **chickens**, turkeys, ducks, and many wild birds.

***Transmission:-**

1-In birds and other nonfelines, only the extraintestinal (**tissue**) cycle of *T. gondii* is known.

2-Tachyzoites and **bradyzoites** may be **spread to birds** by carnivorous ingestion, and sporulated **oocysts are spread by cat feces**.

3-After ingestion, T. gondii tachyzoites, may be spread to the **brain**, eye, **heart**, **liver**, **lungs**, and nucleated red blood cells of birds.

4- Eight or more tachyzoites are produced in a **host cell**. A final generation of tachyzoites develops into **tissue cysts**, in which **bradyzoites** multiply, **Encysted bradyzoites** develop intracellularly in the **brain**, heart, eyes, and skeletal muscles but are **walled off** as immunity develops.

5- Cysts may persist for the life of the host or, if **immunity decreases**, **bradyzoites** may be released and a proliferation of tachyzoites renewed.

6- Arthropods such as **flies** and **cockroaches** can serve as transport hosts for the *Toxoplasma*.

7- Earthworms ingest *Toxoplasma* oocysts and are a source of infection for chickens.

***Clinical Signs:**

- 1-anorexia, emaciation, paleness and shrinking of the comb.
- 2-diarrhea, whitish feces.
- 3-drop in egg production.
- 4-incoordination, ataxia, trembling, **torticollis, blindness.**
- 5-high mortality.

***Gross lesion:-**

- 1-Enlargement of liver and spleen.
- 2-Pericarditis, myocarditis.
- 3-**Encephalitis.**
- 4-**Ulcerative enteritis.**
- 5-necrotic hepatitis, lung congestion.

***Histopathology lesion:-**

- 1- In chickens inoculated by **intracerebral (IC)** and **(IM)** routes, *Toxoplasma* tissue cysts were found in the **cerebrum, brain stem, and optic nerve.**
- 2- *Toxoplasma* cysts were found in myocardium, pancreas, and testes of chickens infected intramuscularly.
- 3- **Coagulation necrosis** and diffuse sinusoidal congestion were observed in the liver.
- 4- The **myocardium, pancreas, and testes** were diffusely infiltrated with **lymphocytes, plasma cells, and heterophils.**
- 5- In the **brain**, infection caused **lymphocytic lesions** and plasma **Cell-cuffing of blood vessels.**
- 6- **Gliosis** of the lateral ventricle and around vessels of the cerebrum, brain stem, and cerebellum.

***Diagnosis:-**

1- *T. gondii* may be **isolated** and **identified** by injecting **suspensions** of infected tissues into various species of laboratory animals, **chicken embryos**, or cell cultures.

2-Inoculation of mice **Intraperitoneal** or **Intracerebral** with suspensions of **brain** and **heart** are methods of isolation.

3-Serology test like ELIZA test.

4- Impression **smears** of peritoneal fluids or tissues stained with **Giemsa** or tissue sections of **brain**, liver, spleen, lung for direct **microscopic** observation of *Toxoplasma*.

5- *Toxoplasma* can be grown in the **chorioallantoic cavity** of 6–12-day-old embryonated chicken eggs.

6-Smears of the chorioallantoic membrane and yolk sac stained with Wright's stain reveal numerous free and intracellular toxoplasmas.

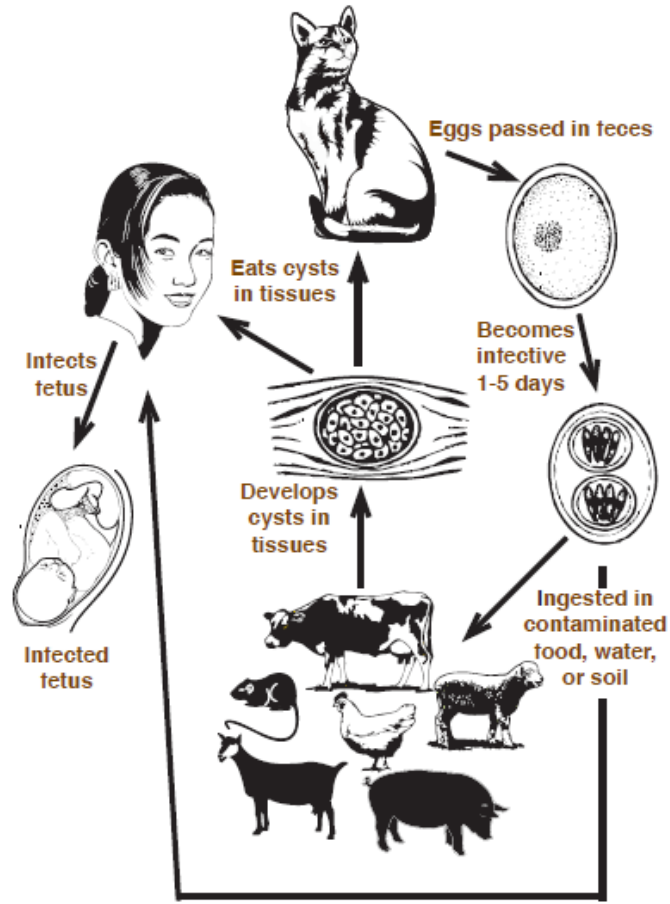
***Treatment, Prevention and Control:-**

1-Chemotherapy has **not** been used control avian toxoplasmosis.

2-Prevention of avian toxoplasmosis requires **management practices** that **eliminate** the **source of infective tachyzoites** and **oocysts** by **preventing** exposure to **rodents**, flies, Cockroaches and **cats**.

3-**Oocysts disseminated** throughout the **premises** are **resistant** to common laboratory **detergents**, acids, and alkalis and are, therefore, **difficult to destroy**.

4-However, they may be **destroyed** by ammonia, **drying**, and a temperature of **55°C**.



Life cycle of *Toxoplasma gondii*

