University of Diyala

College of Veterinary Medicine

Department of Anatomy and Histology

Histopathological Changes of Placental and Fetal tissue in Cases of Toxoplasmosis.

A Research Proposal

As a partial requirement for degree

Baccalaureate in Veterinary Medicine

2020-2021

Prepared by

Talib Jawad Kadhim. PHD. Anatomy, College of Medicine, University of Diyala \ Iraq

Abstract

Back ground: Many previous studies done to identify the infected fetal organs and histological changes of the placental and fetal tissue in an induced toxoplasmosis of pregnant animals experimentally, so the present study applied the same study but on pregnant women and on their placenta and fetal tissue.

Aim: To identify which of the fetal tissues and organs are invaded directly by the parasite itself, and to determine the histopathological changes that may resulted from infection of pregnant women with *Toxoplasma gondii*.

Patients and method**:** Ten aborted fetuses will be taken from ten pregnant women who had abortion and diagnosed by ELISA (Enzyme Linked immune Sorrbant Assay) as infected with toxoplasmosis which were revised to the gynecology theater, in hospitals in Baquba city. Gross, histopathological examination and Immunohistochimcal (IHC) stain depended of the fetal organs and tissues. Toxoplasmosis will diagnosed serologically by ELISA (Enzyme Linked immune Sorrbant Assay) test. Immuno- histological techniques are used to detect the antigen and determination of their morphological localization in fetal and placental tissue. Formalin fixed paraffin embedded tissues (placenta and specimens of organs from aborted fetus) used to determined the antigen (Toxoplasma gondii) to detect the histological changes in these tissues.

Key words: congenital toxoplasmosis, tachyzoites, Toxoplasma gondii, Abortion, Placenta.

Introduction:

Many study was designed to explore histopathological changes occur in placentae of aborted women infected with Toxoplasma gondii, of theses

that's done by Anwar Khalil Ismael, Thaer Abdulqader Salih, during 2029, they found that lymphocyte infiltrations, vacuolation, necrosis in placental villitis, hemorrhage, and existence tachyzoite, bradyzoite and tissue cysts in placental tissue comparedto the control which did not show these changes.

Another study done by Sukayna Jabbar, in 2020., showed a significant increase in levels of mononaldehyde and a decrease in the level of nitric oxide and clotathione in the infected group compared to the control group. There was also a significant increase in the levels of ALP, ALT, AST in the infected group compared with the control group. Histological changes that occurred in the tissue sections of the placenta of aborted women showed a collapse of the placenta tissue because of the rapid reproduction of the parasite and the presence of large spaces in the tissue due to the formation of tissue bags of the parasite causing the death of cells forming the placenta tissue because of secretions and toxins produced by the parasite resulting in abortion or congenital malformations in the fetus and neonatal nervous system injuries.

Marjan Abbasi, Kinga Kowalewska-Grochowska, Mohammad A. Bahar, Ruhangiz T. Kilani, Bonnie Winkler-Lowen, Larry J. Guilbert, at 2003, in their study followed how the intracellular parasite *Toxoplasma gondii* causes placental inflammation and infects the fetus is unknown. By use of a culture model of primary human trophoblasts, they examined the consequences of infection by a virulent strain of *T. gondii*. They found that here was no *T. gondii*–dependent accumulation of putative cytotoxic factors, such as tumor necrosis factor–α, that could mediate paracrine killing. Both mature and immature trophoblasts can be productively infected, and uninfected, but not infected, cells undergo apoptosis.

Toxoplasma gondii a common protozoan parasite responsible for both severe congenital birth defects and fatal toxoplasmic encephalitis in

immunocompromised people, exists in 3 forms: oocysts, tachyzoites, and tissue cysts filled with bradyzoites [4].

Tachyzoites (invasive forms) are polarized oval structures (4–8 μm long) that are capable of invading nucleated mammalian cells. Tissue cysts form within the host cell and may contain up to several thousands of bradyzoites (infective stages) that remain alive for the lifespan of the host. Congenital fetal toxoplasmosis may result in abortion, stillbirth, or severe mental retardation; infections in late pregnancy may be asymptomatic but present with retinal or neurologic damage later in life [5]

Expected Results: The Immunohistochemical technique (IHCT) may show presence of Tachyzaites in the tissue sections of the brain and lungs, while may not found in the tissue sections of the other organs (liver, limbs, spleen and kidneys) in the aborted embryos infected congenitally with toxoplasmosis. The histopathological changes of the tissue taken from aborted fetus may showed different infiltration by inflammatory cell and necrotic changes in brain, liver, lung, upper and lower limbs [6].

References :

1- Sukayna Jabbar, Histological Changes in the Placenta and Some Physiological Effects for Aborted Women Infected with Toxoplasma gondii. January 2020Annals of Biology 36(0970-0153):22-25

2- Anwar Khalil Ismael, Thaer Abdulqader Salih. Histopathological Study of Aborted Women Placenta Infected with Toxoplasma gondii. *Journal of Education and Scientific Studies*, *2019, Volume 4, Issue 13*, *Pages 133-14,*

3-Marjan Abbasi, *Kinga Kowalewska-Grochowska*, *Mohammad A. Bahar*, *Ruhangiz T. Kilani*, *Bonnie Winkler-Lowen*, *Larry J. Guilbert*. *Infection*

of Placental Trophoblasts by Toxoplasma gondii Journal of Infectious Diseases, Volume 188, Issue 4, 15 August 2003, Pages 608–616

4- Remington JS, McLeod R, Thulliez P, Desmonts G. Remington JS, Klein JO. Toxoplasmosis, Infectious diseases of the fetus and newborn infant. 5th ed, 2001TorontoWB Saunderspg. 205

5- Wong SY, Remington JS. Toxoplasmosis in pregnancy, Clin Infect Dis, 1994, vol. 18 (pg. 853-61)

6- Akihiro Unnoab, Seira Kachi, Tatiana A. Batanova, Tamio Ohnob, Nagwa Elhawary, Katsuya Kitoh, Yasuhiro Takashima. Toxoplasma gondii tachyzoite-infected peripheral blood mononuclear cells are enriched in mouse lungs and liver Experimental Parasitology. Volume 134, Issue 2, June 2013, Pages 160-164.