Effect of immune response on TGF-B levels in aborted females with *T.gondii* and Cytomegalovirus

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Abstract. Researched was the immune response on Transforming growth factor beta levels in aborted females infected with *T.gondii* and Cytomegalovirus in infected females serum. The samples were collected from aborted females from 2023/10/1 to 2024/4/1 than diagnosed in the infection with *T.gondii* and *Cytomeglovirus* by detection their IgG and IgM antibodies levels in their serum. The number of females that this study examined was 150, classified into 3 groups, the number for references during study period 30 which are group number1, 60 aborted females for unknown reasons as group 2 and 60 females infected with *T.gondii* and Cytomegalovirus as group 3.

1 Introduction

The most prevalent protozoan parasite in the world, *Toxoplasma gondii* is an obligatory intracellular coccidian apical complexan parasite that may infect a variety of mammals, including humans [1]. Human Acquired infection by accidental ingestion of contaminated food and water with *T.gondii* or uncooked meat that carry the parasite [2]. *T.gondii* transmit from mother to fetus via placenta and the infection risk level rise with pregnancy aging. The infection during first pregnancy months led to abortion or fetal death inside the uterus while the risk of infection rises in the last three months because of blood flow and uterus size increases [3]. Human *Cytomgalovirus* considered as significant world problem especially in poor hygiene communities, Infection with CMV acquired from close contact to contiguous or positive patents body fluids sexually; perinatally; transplacentally; bresastfeeding, infection with CMV in pregnant females can cause several permanently problems to fetus even may led to death [4, 5]. Plays a vital role in modulating inflammatory responses. Additionally, it is crucial in the differentiation of stem cells and the regulation and differentiation of T-cells. This multifaceted protein ensures that the immune system functions properly while also guiding stem cells to develop into specific cell types [6]. The TGF-β family, also known as the Transforming Growth Factor beta family, is a broad category of structurally similar ligands or cytokines referenceling a number of cellular functions, including immune response, adhesion, motility, cell differentiation, and cell cycle progression. Three mammalian varieties of TGFβ, TGFβ1,

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TGFβ2 and TGFβ3 are also present in humans, whereas TGFβ4 is found in birds and TGFβ5 is found in frogs [7]. When TGFβ is coupled to two additional proteins, it is released by macrophages in an inactive condition. TGF-β is kept dormant by this complex until it is required for biological processes. Proteinases like plasmin catalyse the activation of TGFβ from its complex [8]. TGFβ isoforms are encoded as big protein precursors and have a great deal of structural similarity. While TGFβ2 and TGFβ3 each have 412 amino acids, TGFβ1 only has 390. Each isoform contains a pro-region known as the Latency-Associated Peptide (LAP) [9-11]. While TGF-β is an important regulator of several vital cellular processes, the mechanisms by which it is activated are still only partially understood**.**

2 Materials and methods

2.1 Sample collections

The samples were collected from aborted females from 2023/10/1 to 2024/4/1 than diagnosed in the infection with *T.gondii* and *Cytomeglovirus* by detection their IgG and IgM antibodies levels in their serum. More details on group collection, G1,2,3, here [5, 12]. Blood samples were drawn and collected in serum tube from aborted females clinically suspected infection with *T.gondii* and Cytomegalovirus and healthy females as reference group from 2023/10/1 to 2024/1/1 in AL-Zahraa hospital in AL-Najaf province by disposable syringe, the blood specimens than centrifuged at 3000 rpm for 5 minutes to isolate serum and then *T.gondii* & Cytomegalovirus IgG and IgM levels test performed to diagnosis. The serum of positively specimens and healthy negative specimens have been collected in sterile tubes, each sample of serum was distributed into four parts, all of them was kept in deep freeze at -20C º until used for immunological tests.

2.2 Transformational Growth Factor-Beta

An ELISA kit was used to measure TGF-β. Using the materials included in the TGF-β ELISA Kit, TGF-β levels were determined from patient serum samples.

2.3 Analysis of Data

Statistical analysis was made using (graph pad prism version 5) computer software according to T-test, the mean value and standard error (SE) for each value was determined.

3 Results

Estimation of Transforming growth factor Beta (pg/ml) ELISA KIT. The study showed that concentration of TGF-β (pg/ml) no significant increase in patients aborted females for unknown reasons (G2) (143.7 ± 16.74 pg/ml) compared with reference group (G1) (185.9 ± 23.15 pg/ml) P 0.0765, but when compare between aborted females infected with *T.gondii* and CMV (G3) (322.3 ± 44.74 Serum levels of MIP-3 α (ng/L) Chapter Four: Results 65 pg/ml) with reference group (G1) (185.9 ± 23.15 pg/ml) P 0.0497 as seen in Table 1.

Table 1. Shows concentration range of TGF-β in aborted females for unknown reasons and aborted females infected with *T.gondii* and Cytomegalovirus compared with healthy females.

Group	Concentration of TGF-β in (pg/ml)
G1	185.9 ± 23.15
G2	143.7 ± 16.74
G3	322.3 ± 44.74

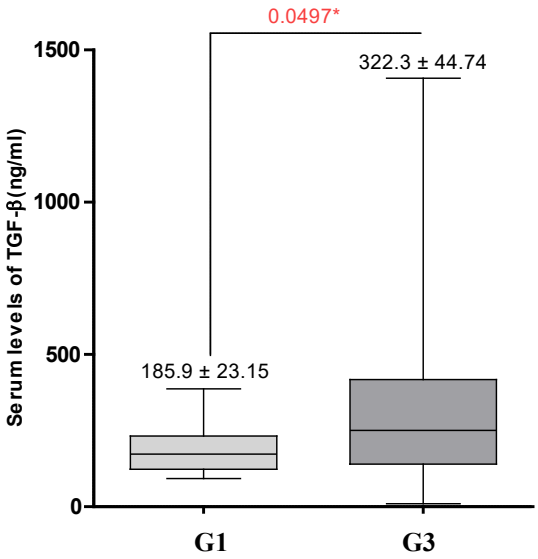

Fig. 1. Shows TGF-β levels range in serum between reference group (G1) and aborted females infection (G3).

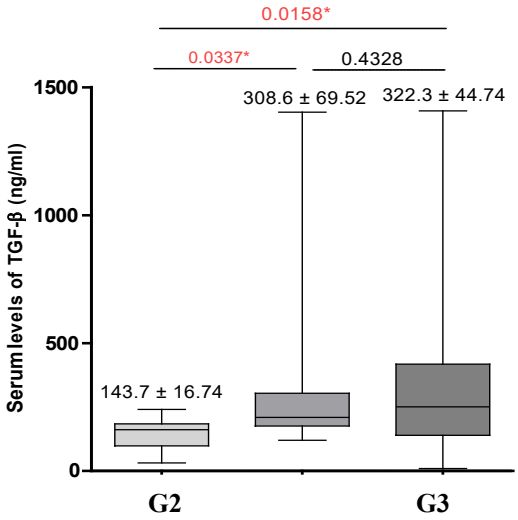

Fig. 2. Shows TGF-β levels range in serum between aborted females for unknown reasons group (G2) and aborted females infection (G3).

4 Discussion

TGF-β of aborted females infected with *T.gondii* and Cytomegalovirus is the following 322.3 ± 44.74 pg/ml, aborted females due to unknown reasons - 143.7 ± 16.74 pg/ml, while 185.9±23.15 pg/ml in reference. The levels of TGF-β *T.gondii* and Cytomegalovirus show significant increase. The TGF-β family is a broad class of structurally similar ligands or cytokines that play a critical role in referenceling a number of cellular functions, including adhesion, immunological response, motility, cell differentiation, and cell cycle progression. There are influences on TGF-β levels due to immune response against *T.gondii* and Cytomegalovirus which is activated through activation of plasmin that lead to activate TGF-β from its latent form, The studies shown that TGF-β have critical role in maternal immune tolerance to reduce immune response against the fetus. Normally pregnant females have slightly increased levels of TGF-β that enhance maternal immune tolerance and immune system homeostasis. This study demonstrate increased TGF-β levels in pregnant females and evolution of these levels due to infection with *T.gondii* and Cytomegalovirus will increases the TGF-β levels that influence immune tolerance making immune cells unable to defense against the infection especially NK T-cell which have important role in viral and parasite infections reference as a result may lead to abortion. TGF-β is the main in the differentiation of CD4+ T cells into two distinct types: induced suppressor T cells, which have a regulatory function, and Th17 cells, which are known to secrete pro-inflammatory cytokines.

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