



Dynamic Behavior of Directly Modulated Semiconductor Laser Utilizing Optical Feedback

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الخلاصة

في هذا العمل، تمت محاكاة السلوك الديناميكي في ليزر أشباه الموصلات ذات التضمين المباشر باستخدام التغذية العكسية البصرية باستخدام برنامج ماتلاب. أظهرت النتائج أن كثافة حاملات الشحنة وعدد الفوتونات تزداد عند استخدام التغذية العكسية. تمت دراسة تأثير انعكاسية المرأة الخارجية على القدرة الخارجة، ووجد أن عند ازدياد انعكاسية المرأة يزداد خرج الليزر أيضاً. كذلك تم دراسة تأثير المسافة بين منظومة الليزر والمرأة الخارجية، حيث وجد أن أعظم قدرة يمكن الحصول عليها عند مسافة بحدود (75,0-7,0) سم.

الكلمات المفتاحية

ليزرات أشباه الموصلات، التضمين المباشر، التغذية العكسية البصرية.



Reference

- [1] AL-Saeed,M.;Muhsin ,M.A. and AL-Juburi ,G.J.Study the role T.gondii, Cytomegalovirus and ant phospholipids antibodies in cases of abortion among women in hilla city.QMJ.4(6):12-20. (2008) .
- [2] Montoya, J.G. and Liesenfold ,O.Toxoplasmosis lancet .363 :1955-1976.(2004).
- [3] Majeed, A.k .Toxoplasma gondii and Cytomegalovirus positivity pathogen in high–risk patient in Iraq. Alanbar .J.vet.sci.4 (1):45-49. (2011).
- [4] Ross, D.S;Jones,J.L. and Lynch ,M.F .Toxoplasma , Cytomegalovirus ,Listeriosis and preconception care . Matern .Child .Health.J.10:187-1910. (2006).
- [5] Hardiman, A.E.; Butter, K.C. and Roe, G.J. Cytomegalovirus infection in dialysis unit. Clin. Nephrol..23:12-17.(1985)
- [6] Jahrom.A.S.Makiani, M.J.;forjam, M.R. Madani A.;Amirian ,M. ;Elfekhri, T.E.and Hamidipour, S.J.Infect.Dis.6(1):8-12 .(2010).
- [7] Sebastian,D.; Zuhara, K.F. and Sekaran, K. Influence of TORCH infection in first trimester miscarriage in the Malabar region of kerala .Afri.J.Mic. Res.2:56-59. (2008).
- [8] Karabulut, A; Polat, Y.;Turk ,M.and Balci,Y.I. Evaluation of Rubella, Toxoplasma gondii and Cytomegalovirus Seroprevalences amongpregnant women in denizli province .Turk .J.Med.Sci.41(1):159-164 .(2011).
- [9] Turbadkhar,D.;Mathur ,M.and Rele ,M. Seroprevalences of TORCH infection in bad obstetric history .Ind .J. Med .Microbiol .21(2):108-110.(2003).
- [10] Al.Dulaimi, S.S. Seroepidemiological study of Toxoplasmosis among aborted women in AL. Anbar J.Scie.Geom.4:1-3.(2004).
- [11] Colugnati ,F.B; Staras, S.A. and Dollar, S.C. Incidence of Cytomegalovirus infection among the general population and among pregnant woman in the united states.BMC infect. Dis..71-78. (2007).
- [12] Chopra.S.; Arora,U.and Aggarwal ,A.Prevalence of IgM Antibodies to Toxoplasma, Rubella and Cytomegalovirus infection during pregnancy .JK. Sci.6(4.)190-192 .(2004).
- [13] Sen,M,R.;Shukta ,B.N.and Banerjee,T.Prevalence of serum Antibodies to TORCH infection in and Around Varanasi, Northern. India.J.Clin and DIAG .Res.6 (9):1483-1485 .(2012) .
- [14] Kumari, N.; Morris,N. and Dutta ,R.Is Screening of TORCH worthwhile in women with Bad obstetric history :An observation from Estern Nepal .J.Health. Popul .Nutr.29(1):77-80.(2011).



Pregnant woman	40	6	15	2	5	8	20	0	0	1	2.5	0	0	23	57.5
Total	100	19	19	7	7	30	30	6	6	7	7	5	5	26	26
	p≤0.01	p≥0.01	p≥0.01	p≤0.01	p≤0.01	p≤0.01	p≤0.01	p≤0.01	p≤0.01	p≤0.01	p≤0.01	p≤0.01	p≤0.01	p≤0.01	p≤0.01

Table (2): Seroprevalence of CMV and T.gondii infection among aborted women according to their residence.

Residence	Total number No.	Anti-CMV IgG		Anti-CMV IgM		Anti-Tox IgG+		Anti-Tox IgM+		Combination					Nega- tive
										Anti-tox Anti Cmv IgG		Anti-tox Anti Cmv IgM			
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Rural	47	12	25.5	3	6,3	17	36.1	5	10.6	4	8.5	5	10.6	1	2.1
Urban	13	1	7.6	2	15.3	5	38.4	1	7.6	2	15.3	0	0	2	15.3
Total	60	13	21.6	5	8.3	22	36.6	6	10	6	10	5	8.3	3	5
	p≤0.01	p≤0.01		p≤0.01		p≤0.01		p≤0.01		p≤0.01		p≤0.01			

Table (3): Seroprevalence of CMV and T.gondii infection among aborted women according to age.

Age group	Total number	Anti-CMV IgG		Anti-CMV IgM		Anti-Tox IgG+		Anti-tox IgM+		Combination					Neg-ative
											Anti-tox Anti cmv IgG		Anti-tox Anti cmv IgM		
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
15-19	9	1	11.1	1	11.1	4	44.4	0	0	0	0	3	33.3	0	0
20-24	13	2	15.3	2	15.4	6	46.1	2	15.3	1	7.6	0	0	0	0
25-29	15	3	20	5	33.3	2	13.3	1	6.6	3	20	1	6.6	0	0
30-34	16	1	6.2	1	6.2	8	50	3	18.7	2	12.5	1	6-2	0	0
35-40	7	2	28.5	0	0	2	28.5	0	0	0	0	0	0	3	42.8
	60	13	21.6	9	15	22	36.6	6	10	6	10	5	8.3	3	5
	p≤0.01	p≤0.01		p≤0.01		p≤0.01		p≤0.01		p≤0.01		p≤0.01			



and Sebastian *et al* [8] who found that *T.gondii* and C.M.V are important microbiology agents causing perinatal infection ,which often lead to mild or asymptomatic infection in the mother and the thing that may result in serious congenital abnormalities or even death of the fetus .

In spite of that the primary C.M.V. infection in pregnant women has higher incidence of symptomatic congenital infection and fetal loss, but this infection will become later asymptomatic and difficult to diagnoses clinical in those women ,making it form one of the risk factor that cause abortion in those women after pass nearly first trimester [9].

In this study *T.gondii* and C.M.V IgG was observed in combination in 6(10%) while IgM was in 5(8.3%) only of the aborted women and this is significant ≤ 0.01 ,when compared to its occurrence of the normal pregnant women in which *T.gondii* and C.M.V. IgG was occurred in combination in 1(2.5%) only .this result confirm the critical role played by the *T.gondii* and C.M.V. to cause abortion ,premature delivery and congenital malformation in ours .

The results also showed high significant incidence of Toxoplasmosis and C.M.V infection among aborted women living in rural areas than those living in urban areas as show in table (2).This

finding is in agreement with other studies [10,11,12]

who back reason it to direct contact for pregnant women in rural areas with domestic animal on the one band and consumption for their product directly without sterilization of the other hand.

In addition to that most of them were in contact with soil that many be heavily contaminated with oocytes, which is sourced from the large number of animal in those areas [13].

A maximum number of *T.gondii* infection was found significantly ($p \leq 0.01$) in females aged 30-34 (IgG 50% and IgM 18.5 %) But the C.M.V infection were in high percent (IgG 20% and IgM 33.3 %) in age group (25-29) as show in table (3). This finding may be attributed to poor hygiene and most of the older aborted women having long time to end the acts of the house ,making women exposed directly to meat ,vegetables and fruits used to prepare meals family which may be contaminated feces of infection animal with oocyte of parasites ,this result disagree with result of [14].

Finally, through the result of the current study we recommend that it is necessary to hold serological screening program for early detection of Toxoplasmosis and C.M.V. infection in pregnant and aborted women in karabala province to reduce the incidence abortion among pregnant women.

Table1: Seroprevalence of CMV and T.gondii infection among Miscarriage women.

Group	Total number No.	Anti-CMV IgG		Anti-CMV IgM		Anti-Tox IgG+		Anti-Tox IgM+		Combination					Negative
										Anti-tox Anti Cmv IgG		Anti-tox Anti Cmv IgM			
		No.	%	No.	%	.No	%	No.	%	.No	%	No.	%	No.	%
Aborted	60	13	21.7	5	8.3	22	36.7	6	10	6	10	5	8.3	3	5



Introduction

Maternal infections play serious and critical role to increase the proportion of abortion in pregnant women, where is the infection by *T.gondii* and Cytomegalovirus one of the most important maternal infection [1].

Toxoplasmosis is a disease caused by *T.gondii* that infection human through ingestion of food and water contaminated with oocytes of these parasite that shed by cats [2]. In addition the soil ,water, fruits and vegetables regarded most common sources of *T.gondii* oocytes ,that mainly transmitted to human or any kind of food that a common consumption by the pregnant woman in particular who regard important intermediate host who accumulate parasite infection (quiescent stage of the parasite) in their tissue especially in the muscle and the brain ,there for responsible to spread the maternal infection which is passed transplacentally via blood to the fetus who will undergo defect mental ,blindness and epilepsy later in life if his birth ,but in the most cases ,suffer the infected pregnant women of abortion and loss of the fetus [3 , 4]

On the other hand, CMV is transmitted by close association between infected subject, through blood or body fluid, sexual contact, or congenitally. The congenital CMV infection is mostly noted as a cause of hearing loss and mental retardation [5].

Toxoplasmosis and CMV infection shares many features ,the most important way of transition and most of these infection are asymptomatic and the adult who are infection with *T.gondii* and CMV are usually have self-limited symptoms and usually develop an immune response represented by antibody agent ,there for determination the IgM and IgG antibody agent is the best ways to

diagnosis these infection early[4,6].

So present study amid to a statement core the prevalence of *T.gondii* and CMV infection with incidence of abortion in pregnant women through the estimate the level of IgG and IgM antibody in miscarriage women in karbala Governorate.

Material and methods

One hundred blood sample (60 sample from aborted women and 40 sample from normal pregnant women) were collected and keeping serum samples separated from blood in small plane tube at $-(2)^{\circ}\text{C}$ until serological analysis, then tested for the detection of antibodies (IgG and IgM) especially for *T.gondii* and CMV using Enzyme linked immunosorbant assay (ELISA) (Bioelisa kit), according to the manufactures instruction and the result were read at 450 nm in the ELISA reader .

Statistical analysis: This was performed using analyses of variance (ANOVA) and least significant difference (LSD) for differentiation among the means of groups. P value less than 0.01 was considered as statistically significant.

Results and Discussion

This study revealed ,that 100 blood samples were collected from 60 aborted women and 40 normal pregnant women .Out of 60 aborted women 13(21.7%) gave positive result for IgG C.M.V ,but only 5(8.3%) were positive for IgM C.M.V ,whereas 22 (36.7%) and 6(10%) were positive for IgG and IgM *T. gondii* respectively ,these ratio were higher than record between the pregnant women which were IgG 6(15%) and 8(20%) but IgM 2(5%) and 0(0%) for CMV and *T.gondii* respectively these difference were statistically significant ($p \leq 0.01$) as show in table (1) This result agree with Jahrom *et al*



Abstract

This study was designed to determine the relationship between the prevalence of *Toxoplasma gondii* and Cytomegalovirus infection and rate for miscarriage among pregnant women in karbala Governorate .In addition to clarify relationship the spread of these infection with the age . of the women and place of domicile

One hundred blood sample were collected from women (60 aborted women and 40 pregnant women) to test for the detection of antibodies (IgG and IgM) for *T.gondii* and Cytomegalovirus using enzyme linked immunosorbent assay (ELISA) .The results were observed that higher rate of IgG (36.7%) and IgM (10%) specific for *T.gondii* among aborted women than normal pregnant woman (20% and 0%) respectively ,while the rat of IgG and IgM specific for CMV among aborted women were (21.7% and 8.3%) respectively in compare to normal pregnant women which was (15% and 2%) respectively as result showed high incidence of infection among .aborted women living in rural area in compared to those living in urban area

Keywords

Toxoplasma gondii ,Cytomegalovirus, miscarriage, IgG and IgM.