

EVALUATION OF SEROPREVALENCE OF HERPES SIMPLEX  
VIRUS IgG ANTIBODY IN BAQUBA CITY BY USING ELISA TECHNIQUE

\* Khudair Kh . Ibrahim Al- kayalli\* Mohammed K. Khudair Al- Azawy \*\* Ammar T.Nasser  
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Ammar T.Nasser Al- Azawy\*\*\*

\*Diyala University  
College of Medicine

\*\* Diyala University  
College of Senescs

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**Abstract**

Herpes simplex virus infection is a viral infection caused by herpes simplex virus , which infect the skin and mucous membrane , which is of two types (HSV-1 & HSV-2) , type one is the common infection , both sex are affected , type-1(labial) most commonly seen in childhood and type-2 (genital) in adulthood which is sexually transmitted. The aim of the present study was to evaluate the seroprevalance of herpes simplex virus infection among Iraqi population. A cross sectional study , in which (398) persons (200) healthy volunteers and (198) with different skin disease (except HSV infections) were included , during the period from the first of January to the first of Jullay 2013 in Baquba city and outpatient clinic of Baquba Teaching Hospital , their ages ranged from (1-60) years , they were (187) males and (154) females . Blood samples were taken from all persons , to identify the IgG antibody for the herpes simplex virus type 1 and 2 ,by using ELISA technique in Baquba city . Certain data regarding sex , address, education and occupation were recorded .The study showed that (315) (79.09%) of evaluated persons were positive for anti-herpes simplex virus IgG antibody with ( $P<0.001$ ) and more prevalent in females (40.4%) than males (38.69%) , predominantly in age group (21-40 years )(39.6%) , with a significant differences ( $P<0.001$ ) and more prevalent in civilized and those of low education levels ( $P<0.001$ ) . Also the HSV-1 antibody was more prevalent (56.51%) than HSV-2 (43.45%) , without significant value . It was

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concluded that (79.09%) of general population were seropositive for HSV- antibody , more in females than males and HSV type-1 was more prevalent than HSV type-2 .

**Key words:** Herpes simplex virus, IgG, ELISA Technique

تحديد انتشار فايروس الهربس سبرولوجية بالكشف عن الاجسام المناعية Log في مدينة بعقوبة  
بأستعمال تقنية الاليزا

ا.م.د. خضير خلف ابراهيم ، ا.د. محمد خليفة خضير ، عمار طالب ناصر

الخلاصة

مرض الحلاّ البسيط هو التهاب فيروسي معدي يصيب الجلد والاعشبة المخاطية يسببه فيروس الحلاّ البسيط وهو على نوعان الاول والثاني حيث ان النوع الاول هو الاكثر شيوعا وخاصة في الاطفال والنوع الثاني يصيب عادة البالغين ومن الامراض المنقولة جنسيا يصيب النوعان كلا الجنسين .

أجريت هذه الدراسة للفترة من 1 / 1 / 2013 الى 1 / 7 / 2013 وشملت ( 398 ) عينة دم لأشخاص منهم (200) شخص متطوعين اصحاء و(187) مرضى مصابين بامراض جلدية مختلفة عدا الحلاّ البسيط , تتراوح اعمارهم (1-60) سنة ,منهم (187) من الذكور و(211) من الاناث , لتحديد حاملي الضد النوعي IgG لفايروس الحلاّ البسيط للنوع الاول والثاني باستعمال تقنية الاليزا في مدينة بعقوبة .

اظهرت النتائج ان عدد الحاملين لل ضد النوعي IgG لفايروس الحلاّ البسيط (315) وبنسبة (79.51%) وبتوافر فرق معنوي بقيمة ( $p < 0.001$ ) كذلك بينت النتائج ان نسبة الحاملين لل ضد النوعي بين الاناث اعلى من الذكور وبنسبة (40.4%) و (38.69%) على التوالي وان اكثر الفئات العمرية الحاملة لل ضد هي فئة (21-40) سنة وبنسبة (39.6%) وبوجود فرقا معنويا بقيمة ( $P < 0.001$ ) كما اظهرت النتائج ان الحاملين لل ضد النوعي IgG لسكنة المدينة اعلى منه في الريف مع عدم ظهور فرق معنوي. وبينت النتائج ان انتشار الضد النوعي IgG بين غير المتعلمين هو الاعلى في عينة الدراسة وبفارق معنوي بقيمة ( $P < 0.001$ ), ايضا اوضحت الدراسة الحالية ان انتشار النوع الاول والثاني لفايروس الحلاّ البسيط مرتفع بين عينة الدراسة وبنسبة (56.51%) و (43.49%) على التوالي وبدون فرق معنوي.

الكلمات الدالة: فايروس الحلاّ , IgG, تقنية اليزا

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## INTRODUCTION

Herpes simplex virus is one of the common viruses that causes skin disease all over the world by direct contact with infected individuals , sexually and non sexually , which include cold sores, genital herpes, conjunctivitis with low finger infection and other areas of the body (1) . More than 500 million cases are recorded all over the world and about 23 million cases are reported annually , in USA up to 100% of adult individuals are seropositive for HSV-1 antibody and the children of different age group are more liable for HSV-1 infection about 85% of children under the age of 10 years are affected and 35% of neonate has positive HSV-1 antibody and 50% of adult individuals are positive for HSV-2 antibody in USA (2)

Herpes simplex virus infection type one (HSV-1) is common in developing countries , while herpes simplex virus infection type two (HSV-2) is common in developed countries . Clinically the infection in both type is presented in two forms , primary and recurrent infections, usually the primary infections is more severe with constitutional symptoms than the recurrent infections . Herpes simplex virus infection type-1 usually affected the face including the lips and oral mucosa while the type -2 affected predominantly the genital areas , usually the infection precipitated by fever , emotional stress , trauma , sun light and surgery . After primary infections the HSV remained dormant in trigeminal ganglia in type -1 and sacral ganglia in type -2 virus (3)

Herpes simplex virus infections are more prevalent in immunosuppressed adults , whatever the cause , than in immunocompetent and may cause severe and fatal infection for e.g encephalitis , meningitis and corneal ulcers , also in patients with HIV disease , the infections are more severe and wide spread and in about 80% the infection become chronic and recurrent (4) The aim of the present study is to evaluate the seroprevalence of HSV in general and HSV type-1 and HSV type-2 IgG antibody among general population and patients with different skin diseases in Baquba city , by using ELISA Technique .

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### **MATERIAL AND METHOD**

A cross sectional study involved (398) persons , their ages ranged from (1-60) years , they were (187) males and (211) females and divided into two groups , the first one include (200) healthy volunteers and the second include (198) patients with different skin disease other than herpes simplex virus infection attending the outpatient clinic of Baquba Teaching Hospital , collected randomly . Blood samples were taken from all persons and evaluated for the prevalence of herpes simplex virus IgG antibody in general and the prevalence of HSV (type -1) and (type-2) by using ELISA technique .

- 1- Group one : Which include (200) healthy volunteers collected from primary, secondary and colleges student in Baquba city, their ages , sex , occupation and educational state were interogated and blood samples were taken and screened for the prevalence of HSV IgG antibody as well as HSV typ-1 and type-2 antibody .
- 2- Group two: Which include (198) patients with different skin disease other than herpes simplex virus infection who attend the outpatient clinic in Baquba Teaching Hospital , also blood samples were taken from them to evaluate the prevalence of HSV-IgG in general and HSV (type-1) and (type-2) antibody . Computer was used for statistical analysis by using Chi-squar test (P.value ) .

### **RESULTS AND DISCUSSION**

**Table-1: Distrebution of persons according to seropostivity of HSV-Antibody .**

Total No	Positive sample	%	Negative sample	%	P.value
398	315	79.51	83	20.85	P <0.001



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Table-1: The study showed that (315) persons (79.51 %) out of (398) had positive result for HSV-IgG antibody which was statistically significant ( $P < 0.001$ ).

These results were comparable with that of other study done in Iran 2010 in which (80.11%) of studied individuals are positive for HSV-IgG antibody (5) and the study done in UK 2001-2006 ,in which (78.94%) was positive for HSV-IgG antibody and incomparable with study done in Amsterdam in which only (27.25%) shows positive result (6).

**Table-2: Distribution of seropositive persons according to gender .**

Total No.	Total seropositive & %	Total males &%	Seropositive males & %	Total females & %	Sero positive females & %	P.value
398	315(79.09%)	187(46.98%)	154(38.69%)	211(53.2%)	161(40.4%)	$P > 0.005$

The Table-2: Revealed that (154) persons (38.69%) of those with positive serology was males and (161) persons (40.4%) was females and the total number of males was (187) (46.98%) while the total number of females was (211) (53.2%).

These results was concordant with that done in Italy 2012 and in Japan 2010 in both the females shows a higher prevalence of seropostvity than the males (7,8)

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**Table-3 : Distribution of seropositive persons according to their age group .**

Age group years	Number of sample	Sero positive	%	P=value
1-20	74	46	11.5	p> 0.001 in significant
21-40	180	158	39.6	
41-60	91	77	19.3	
61-80	53	34	8.5	

Table-3 showed that the age group of (21 -40) years had the highest percentage of seropositivity for HSV (39.6) , age group (61 -80) years had the lowest seropositivity (8.5%) . These results were concordant with that seen in Latin America in 2009 , trees 2006 (9,10) and in concordant with study done in USA in which the age group (50-80) years had the highest percentage of seropositivity (11).

**Table-4 Distribution of seropositivity according to the geographical areas .**

Total NO	Total urban	Seropositive urban	%	Total rural	Seropositive rural	%	p.value
398	214	168	42.18	148	147	36.91	p > 0.20 In significant

Table-4: Showed that the IgG seropositive results were more prevalent in urban (42.18%) than rural areas (36.91%) , but without statistical significance (P > 0.20) . Which was go with

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there result of study done in India 2010 (12) and differ from the results seen in UK and KAS in which (67.22%) of rural areas (13,14) .

**Table -5. Distribution of IgG Seropostivity according to the occupation .**

job	Total No	Sero positive	%	%
Free job	96	76	19	P<0.001
Governorate worker	134	106	26	
Student	168	133	33.4	

Table -5: According to occupation , the seropostiv results were more in student (33.4%) and less prevalent in those with free job (19%) . These results were concordant with that seen in Jordan 2010 and Makceko (15,16) and in concordant with study done in turkey 2009 in which the resopostivity of HSV was more prevalent in governorate worker Job (55.11%) (17).

**Table -6: Distribution of seropositivity of HSV according to educational stat .**

Educational state	Total No	Sero positive	%	P= value
Non educated	171	163	40.9	P< 0.001 signification
Infants	27	7	1,7	
Preschool age	18	11	2.7	
Primary school age	30	16	4	
Secondary school age	30	24	6	
Precollege school age	50	31	7.7	
University student	72	63	15.8	

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Table-6: According to the educational stat , the seropositive results were more prevalent in non educated persons (40.9%) and less prevalent in preschool children (1.7%) , which was statistically significant ( $P < 0.001$ ) . Which was identical to result of study done in India )in preschool children this may be due to strainsplacental passage of IgG from mothers with high prevalence of HSV seropostivity (11).

**Table -7: Seroprevalence of HSV-1 and HSV-2 IgG antibody .**

HSV-Type	Seropostive sample	%	p-value
HSV-1	178	56.5	p>0. 001 non signification
HSV-2	137	43.49	

Table-7: Regarding the type of HSV , the study reveled that the HSV-1 IgG antibody was more prevalent (53.21%) than HSV -2 IgG antibody (43.49), which was statistically non significant . This results was concordant with that seen in Iraq 2011 in which (58.4%) had HSV-1 IgG seropostivity and (41.6%) of HSV-2 (19). This was due to the religious limitation of illegal sexual activity , which limit the spread of HSV-2 .

### CONCLUSION

It was concluded that the HSV infection was a common viral infection and effecting (79.09%) of general population and predominantly in young adult (21-40) years , non educated , in rural areas and HSV-1 infection was the most prevalent (56.51%) .



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**REFERENCES**

1. **Xu** , Sternberg , M.R. , Kottiri B.J. et al . Trends in herpes simplex virus type 1 and type 2 seroprevalence in the United States . JAMA 2007; 296: 964–973.
2. **Looker** K.J. , Garnett G.P. , Schmid GP. An estimate of the global prevalence and incidence of herpes simplex virus type 2 infection. Bull World Health Organ 2008; 86: 805–843.
3. **Brown** Z.A. Gardella C. ,Wald A , Morrow R.A , Corey L. Genital herpes complicating pregnancy. Obstet. Gynecol 2005;106: 845-56.
4. **Gilbert** S , Corey L , Cunningham A. et al . An update on short-course intermittent and prevention therapies for herpes labialis. Herpes.2012;14(suppl 1): 13A–18A.
5. **Tayyebi** D, Sharifi S.f . Seroepidemiology of Infection with Herpes Simplex Virus Type 1 and 2 (HSV1 and HSV2) Among A symptomatic university Students Attending Islamic Azad University of Kazeroun, Southwest of Iran. Iran J Clin Infect Dis 2010; 5(2): 84-88.
6. **Berrington** W.R , Jerome K.R. et al . Clinical correlates of herpes simplex virus viremia among hospitalized adults. Clin Infect Dis. 2009(Nov 1); 49(9): 1295-301.
7. **Wutzler** P , Doerr H.W , Farber I , Eichhorn U , Helbig B , Sauerbrei A . Seroprevalence of herpes simplex virus type 1 and type 2 in selected German populations - relevance for incidence of genital herpes J Med Virol 2007; 61: 201-207.
8. **Straface** G , Selmin A , Zanardo V , Santis M.D , and Ercoli A , Scambia G . Herpes Simplex Virus Infection in Pregnancy. Infect Dis Obstet Gyneco 2012; 1: 385-697.
9. **Kim** D , Chang H.S. , Hwang K.J . Herpes Simplex Virus 2 Infection Rate and Necessity of Screening during Pregnancy: A Clinical and Seroepidemiologic Study. Yonsei Med J.2010; 53: 401-7 .
10. **Obeid** OE . Prevalence of herpes simplex virus types 1 and 2 and associated sociodemographic variables in pregnant women attending King Fahd Hospital of the university. J Fam Commun Med. 2007; 5: 7-14.
11. **Smith** P.D. Roberts CM . American College Health Association annual Pap test and sexually transmitted infection survey J Am Coll Health. 2009; 57(4): 389-94.

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12. **Apadogeorgakis** H , Caroni C , Katsambas A , Pimenta J.M , Avdeliodi C , Kotrotsou T. et al. Herpes simplex virus seroprevalence among children, adolescents and adults in Greece. *Int J STD AIDS* 2008; 19: 272-800.
13. **Izahrani** A.J , Obeid O.E , Almulhim A.A, et al . Analysis of Herpes Simplex 1 and 2 IgG and IgM Antibodies in Pregnant Women and their Neonates. *Saudi J Obstet Gynaecol* 2007; 5: 53.
14. **Chroeder** H.W , Cavacini L . Structure and function of immunoglobulins. *J. Allergy Clin Immunol.* 2010; 125: S41–S52.
15. **Thore** S , Jamwal A , Gupta V. Herpes simplex virus type 2: Seroprevalence in antenatal women. *Indian J Sex Transm Dis* 2010; 3: 11-35.
16. **Dolar** N , Serdaroglu,S , Yilmaz G , Ergin, S . Seroprevalence of herpes simplex virus type 1 and type 2 in Turkey. *J Eur Acad Dermatol Venereol* 2009; 20 (10): 1232–6.
17. **Maitra** N , Gupta M .Seroprevalence and correlates of herpes simplex virus type-2 infection in a general gynecology clinic. *Arch Gynecol Obstet* 2007; 275: 19-23.
18. **Rezaei** C , Assmar M , Amirmozafari N , Modiri, L , Massiha A , Gholizadeh, Z . Seroepidemiology of herpes simplex virus type 1 and 2 in Anzali city 2010 -2011 . *Zahedan J Res Med Sci (ZJRMS)* 2012; 14(8 ): 67 -69.
19. **Uckerman** R , Wald A , AST R . Herpes Simplex Virus Infections in Solid Organ Transplant Recipients *American Journal of Transplantation* 2009; 9 (Suppl 4): S104–S107.