Systemic Lupus Erythromatosus and Human Herpes Virus 8 among Egyptians

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Abstract: Various factors appear to be involved in SLE, in which viral infections were included. The objective of this study is to establish the prevalence of HHV-8 in SLE patients. To evaluate if there is a possible association between HHV-8 DNA prevalence with the production of specific lupus auto-antibodies. This case-control study was performed in the period from December 2012 to December 2013 in Fayoum. 110 subjects were enrolled in this study. Cases comprised 50 patients diagnosed as having SLE compared to 60 age and sex matched healthy control subjects. In the SLE patient group; 8 were males and 42 were females. EDTA blood was collected for the detection of HHV-8 DNA. The prevalence of DNA human herpes virus 8 (HHV-8), was searched by specific nested polymerase chain reaction. There was a significant difference in the prevalence of HHV-8 DNA between SLE patients and healthy controls (10/50, 20% versus 3 / 60, 5%, respectively, $P < 0.05$). Autoantibodies were compared in the HHV-8 DNA (+) group (n = 10) versus the HHV-8 DNA (-) group (n = 40). HH8V DNA prevalence among SLE patients was not associated with any of the clinical manifestations ($P > 0.05$). Within the SLE group the prevalence of HHV8 did not differ between SLE patients under therapy compared to those not receiving therapy. The prevalence of HHV-8 was statistically significant among the SLE patients compared to the healthy control subjects. These observations could suggest that HHV8 virus may be involved in the pathogenesis of SLE.
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1. Introduction

Systemic Lupus Erythromatosus (SLE) is an autoimmune disease characterized by a wide array of clinical manifestations (Ulff-Moller et al., 2010). The mechanism that triggers SLE is still not clear, that hypothesis that viral infections might play an etiological or cofactorial role has been repeatedly suggested. Evidence suggests that common viruses such as Epstein–Barr virus (EBV), cytomegalovirus (CMV), and parvovirus B19, to which many individuals are exposed during life, may play a role in the pathogenesis of SLE (Denman, 2000).

Human herpes virus 8 (HHV-8), or Kaposi's sarcoma (KS)-associated herpes virus, have a well-established role in the pathogenesis of KS. It belongs to the gamma herpes virus subfamily and is closely related to Epstein-Barr virus (Gerammgad et al., 2002). HHV-8 and EBV have many similarities: both of them are able to infect and build up latency in B lymphocytes. At the same time, they all have the abilities of producing a number of proteins responsible for maintaining viral episomes, promoting B-cell survival and proliferation, inhibiting p53 and most interesting of all, encoding a large number of cellular homologs. Two results can be reached due to the production of cellular homologs; one is structural mimicry, as Epstein-Barr virus nuclear antigen-1 (EBNA-1) mimics human auto antigens Sm and Ro, which has been regarded as one of the possible mechanisms contributing to the onset of autoimmunity; another one is functional mimicry, as HHV-8 expresses the homologs of Bcl-2 to protect virus-infected cells from apoptosis, by which the viral proteins are able to substitute their cellular counterparts to act (Mersi et al., 2010).

Aim of the present study was to; establish the prevalence of HHV-8 in the whole blood of SLE patients and the healthy control (HC) group, detect if HHV-8 is a possible etiology for lupus. Also to evaluate if there is a possible association between HHV-8 DNA prevalence with the production of specific lupus auto-antibodies, clinical manifestations and treatment.

2. Materials and Methods

2.1. Patients

We analyzed 110 whole blood specimens; 50 from Egyptian SLE patients enrolled from Rheumatology and Rehabilitation department, Faculty of Medicine, Cairo University Hospital and Pediatric Department, Faculty of Medicine, Fayoum University Teaching Hospital. The cases were compared to 60 HC subjects. Lupus patients were fulfilling the updated

American College of Rheumatology (ACR) revised criteria for the classification of SLE, (Hochberg, 1997) Secondary Anti-Phospholipid Syndrome (APS) was diagnosed according to the Sapporo criteri (Brandt et al., 1995) Assessment of disease activity was done using the Systemic lupus erythematosus disease activity index (SLEDAI), (Bombardier et al., 1992) disease damage using the Systemic Lupus International Collaboration Clinics/ACR damage index (SLICC/DI) (Gladman et al., 1996).

The study was carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) and after the approval of the local ethical committee of our Institute. Informed consent was obtained from all study subjects after the nature of the study was explained.

In the SLE patient group; 8 were males (16%) and 42 were females (84%). Because the vast majority of adults have been infected with herpes viruses (HHVs), we chose to study children and young adults. The mean (SD) age of the SLE group was 24.76(7.2). The median disease duration was 4 years (range: 0.2-14). All the study group were on medications; Methotrexate (Unitrexate, EIMC united pharmaceuticals, Badr city,Cairo, A.R.E) mean (SD) 27.3 (0.9) mg/day, 44/50 (88%) were on hydroxychloroquine (hydroquine, tablet = 200 mg/day) mean (SD) 320(41.4), 26/50 (52%) were on azathioprine,(Azathioprine, RPG life Science Limited in India and imported by international trading office), tablet = 50 mg, median (minimum – maximum): 50 (0 – 100) mg/dl, 16/50 (32%) were on monthly doses of cyclophosphamide (endoxan, IV 0.5-1 gm/square meter body surface area, monthly for 1st 6 months then every 3 months for another 6 doses, Industries pharmaceuticals, Almirall Prodes Farma S.L., imported by Egydrug), median (minimum – maximum: 0 (0-5.7) g, 2/50 (4%) was on Cellcept (myofortic, tablet = 500 mg, Novartis pharma, Stein AG, Stein Switzerland, and distributed by Novartis pharmaceuticals corporation), median (minimum – maximum): 0 (0-3) g/day.

2.2. Specimen

A 10 ml venous blood sample was withdrawn from the ante-cubital vein and was divided into three parts:

– Two milliliters of venous blood were collected in a sterile vaccutainer containing ethylene diamine tetraacetate (EDTA) as an anticoagulant for DNA extraction of the HHV-8 and stored at – 20^0C.

– Two milliliters of venous blood were collected in a sterile EDTA vaccutainer for the detection of the hemoglobin, total leucocytic count and platelet count.

- Six milliliters of venous blood were collected in a plain centrifuge tube, allowed to clot and then centrifuged for 10 minutes and the serum was separated. Serum was used for the determination of autoantibodies and the routine biochemical testing.

2.3. Methods

DNA Purification: All subjects underwent peripheral blood sampling for examining the presence of HHV8 DNA. Genomic DNA was isolated by means of a Genomic DNA Purification Kit according to manufacturer's instructions (Fermentas Life Sciences, Lithuania).

All specimens were examined for the presence of HHV- 8 DNA by specific nested polymerase chain reaction (n-PCR) using the appropriate set of primers according to the method performed by (Ben Fredj et al., 2002). Each first-round reaction was performed in a 25 µl volume containing: about 20 ng of extracted DNA of each sample, 20 pmol of each primer, 0.6 U Taq polymerase, 12.5 µl Master mix (Fermentas Life Sciences, Lithuania). HHV-8, genome region is minor capsid protein homolog ORF26 gene, the outer primers are 5′-GCC GAA AGG ATT CCACCA T-3′and 5′-TCC GTG TTG TCT ACGTCC AG-3′ (Bioneer.www.bioneer.com, Korea). PCR conditions started by an initial denaturation at 94°C for 5 min followed by 35 cycles of 94°C for 1 min, 58°C for 1 min, 72°C for 1 min with final extension at 72°C for 10 min using a PCR Thermal Cycler (Thermo hybaid, UK). Second round reaction mixes were identical to the first round and the templates were 1 µl products from the first round reactions. The inner primers are: 5′-ACG GAT TTG ACC TCGTGT-3′ and 5′-AAT GAC ACA TTG GTGGTA TAT-3′ (Bioneer.www.bioneer.com, Korea). The PCR conditions started by initial denaturation at 94°C for 5 min followed by 35 cycles of 94°C for 1 min, 56°C for 1 min, 72°C for 1 min with a final extension at 72°C for 7 min using a PCR Thermal Cycler (Thermo hybaid, UK). Aliquots of the PCR reactions were electrophoresed in 2% agarose gels and analysed with ethidium bromide staining. The Amplification size (bp) is 160. In each PCR reaction, we performed two negative controls using sterile distilled water instead of the sample.

Analyses of the autoantibodies (ANAs, Anti Ro, Anti La, Anti ANA, Anti ds DNA, anti LAC, Anti ACL and Anti smith) in the sera of the patients at diagnosis were undertaken by the routine clinical immunology laboratory at the University Hospital. ANAs were analyzed by indirect immunofluorescence with HEp-2 c ells or rat tissue (in house), anti-ds DNA was analyzed on Crithidia luciliae-coated slides (Immunoconcept) and the other autoantibodies were analyzed either by enzyme-linked immunosorbent assay or by immunoblot assay. Routine laboratory parameters were performed on Beckman Clinical Chemistry Autoanalyzer (Europark Fichtenhain B13, Germany) by kits purchased from Human Gesellschaft

fur Biochemica und Diagnostics mbH (Max-Planck-Ring, Germany).

2.4. Statistical Analysis

Statistical analysis was performed using the SPSS Inc. (statistical package for Social Science) version 17 (Chicago, USA) (Dawson and Trapp, 2001). Data were subjected to Kolmogorov-Smirnov test to determine the distribution and method of analysis. Normally distributed quantitative variables (age, systolic blood pressure, diastolic blood pressure, total leucocytic count, platelet count and creatinine) are presented as mean (SD) and the comparisons between groups were performed using Student's t test. Skewed data are expressed as median (range) (SLE disease duration, ESR, hemoglobin and albumin). Categorical variables are given as percentages. A chi-square test was used to compare (sex; prevalence of HHV8 DNA and; autoantibodies - secondary anti-phospholipid syndrome - mucocutaneous manifestations – serositi – nephritis - treatment with immuran - treatment with cyclophosphamide and treatment with hydroxychloroqiune). A *P* value of <0.05 was considered to represent statistical significance.

3. Results:

The demographic and clinical characteristics of the subjects are summarized in Table (1). The age and sex were matched between patients with SLE and HC.

The results on the prevalence of HHV-8 DNA among Egyptians are shown in table (2). There was a significant difference in the prevalence of HHV-8 among SLE patients 10% (10/50) and the control group 5% (3/60) (*P* <0.05) (Figure 1). We compared HHV-8 prevalence among SLE patients, those 18 years old or younger than 18 (14 subjects) compared to those above 18 years old (36 subjects). Among the first group the positive HHV-8 / negative HHV-8 was 2/12 (14.3 % / 85.7%) and those above 18 years of age 5/31 (13.9% / 86.1%), odds ratio 0.968, 95%CI: 0.165-5.682, P value >0.05.

The prevalence of auto-antibodies in the HHV-8 (+) group versus the HHV- 8 (-) group were compared to evaluate the association of the HHV-8 DNA and autoantibodies. In general, the prevalence of auto-antibodies was similar, indicating that the production of lupus-related auto- antibodies is generally not related to HHV-8 (Table 3).

Table (4); To test whether HHV-8 prevalence among the SLE studied patients is associated with clinical consequences of SLE, we divided the SLE patients into two groups; those having the clinical consequence and those without the clinical consequence; nephritis, serositis, mucocutaneous manifestations and secondary anti-phospholipid syndrome. Statistical analysis did not reveal any association between the prevalence of HHV-8 DNA and: nephritis, mucocutaneous manifestations, secondary anti-phospholipid syndrome, physcosis, arthritis and leucopenia. HHV-8 DNA prevalence among SLE patients was not significantly associated with any of the clinical manifestations (*P* >0.05). Also to test whether HHV-8 in SLE was the consequence of an immunosuppressive therapy, we divided the SLE patients into two groups those under therapy and those not under therapy. Within SLE group the prevalence of HHV-8 did not differ between the two groups (*P* >0.05).

Table (1); Demographic, Clinical and Laboratory data for the Study Groups

	SLE	Control	*P* value
Number	50	60	
Age (years) mean (SD)	24.76 (7.2)	26.43 (8.19)	>0.05
Sex Female, N (%) Male, N (%)	 42 (84%) 8 (16%)	 54 (90%) 6 (10%)	>0.05 OR=1.71 95%CI=0.552-5.321
Disease duration (years), median (range)	4 (0.2-14)	----	---
SBP (mmHg) mean (SD)	133.8 (26.9)	121.17 (11.12)	<0.05
DBP (mmHg) mean (SD)	85.4 (11.27)	82.33 (9.07)	>0.05
ESR (median, range)	50 (10-102)	8(5-11)	<0.001
Hg (gm/dL) (median, range)	10(7.8-12.9)	12.8(10.5-15.4)	<0.001
TLC (X 10^3/µL) mean (SD)	9.87 (6.1)	7.73 (1.69)	>0.05
PLT (x10^9/L)mean (SD)	248.36 (108.02)	308.83 (82.67)	<0.05
Creatinine (mg/dl)	1.33 (1.72)	0.92 (2.66)	>0.05
Albumin (mg/dl) (median, range)	3.6(2.1-4.5)	4.3 (3.4-5.3)	<0.01
SLEDAI score mean (SD)	21.24 (8.74)	---	---
SLICC score mean (SD)	0.6 (0.76)	---	---
Steroid dose (mg/dl) mean (SD)	27.3 (9.01)	---	---
Hydroxychloroqiune dose (mg/dl) mean (SD)	320 (141.42)	---	---
Azathioprine dose (immuran) (mg/dl) mean (SD)	50 (50)	---	---
Cyclophosphamide (gm) mean (SD)	0.77 (1.46)	---	---
	SLE	Control	*P* value

* Statistically significant value (*P* <0.05), N = number, Chi Square: Values are the odds ratio (OR) and 95% confidence interval (95% CI), SBP:systolic blood pressure, DBP; diastolic blood pressure, mmHg: millilmeter mercury, ESR: erythrocyte sedimentation rate, Hg: hemoglobin, TLC: total leukocytic count, PLT: platelet count, SLEDAI: Systemic lupus erythematosus disease activity index, SLICC/DI:disease damage using the Systemic Lupus International Collaboration Clinics/ACR damage index, SLE: systemic lupus erythromatosus

Table (2) The prevalence of HHV-8 DNA in patients with SLE and Controls

	SLE	Controls	OR	95%CI	*P* value
HHV- 8 DNA: Positive, N (%) Negative, N (%)	 10(20%) 40 (80%)	 3(5%) 57 (95%)	4.750	1.229-18.361	<0.05

* Statistically significant value (*P* <0.05), Chi Square: Values are the odds ratio (OR) and 95% confidence interval (95% CI), SLE=Systemic Lupus Erythromatosus, HHV-8=human herpes virus 8, N =number

Table (3): Frequency of auto antibodies in HHV-8 (+) and HHV-8 (-) among the SLE Patients

Auto Antibodies		HHV-8		OR	95%CI	*P* value
Anti Ro Positive, N (%) Negative, N (%)	 4/50(8%) 46/50(92%)	HHV-8 Positive, N (%) Negative, N (%)	 10/50(20%) 40/50(80%)	1.278	1.097 – 1.488	>0.05
Anti La Positive, N (%) Negative, N (%)	 2/50(4%) 48/50(96%)	HHV 8 Positive, N (%) Negative, N (%)	 10/50(20%) 40/50(80%)	4.333	0.247 – 76.046	>0.05
Anti ANA Positive, N (%) Negative, N (%)	 48/50(96%) 2/50 (4%)	HHV 8 Positive, N (%) Negative, N (%)	 10/50(20%) 40/50(80%)	0.792	0.685 – 0.915	>0.05
Anti ds-DNA Positive, N (%) Negative, N (%)	 28/50(56%) 22/50(44%)	HHV 8 Positive, N (%) Negative, N (%)	 10/50(20%) 40/50(80%)	0.818	0.204 – 3.276	>0.05
LAC Positive, N (%) Negative, N (%)	 22/50(44%) 28/50(56%)	HHV 8 Positive, N (%) Negative, N(%)	 10/50(20%) 40/50(80%)	1.353	0.337 – 5.427	>0.05
Anti ACL Positive, N (%) Negative, N (%)	 18/50(36%) 32/50(64%)	HHV 8 Positive, N (%) Negative, N (%)	 10/50(20%) 40/50(80%)	1.857	0.458 – 7.528	>0.05
Anti Smith Positive, N (%) Negative, N (%)	 2/50 (4%) 48/50(96%)	HHV 8 Positive, N (%) Negative, N (%)	 10/50(20%) 40/50(80%)	4.333	0.247 – 76.046	>0.05

* Statistically significant value (*P* <0.05), N = number Chi Square: values are the odds ratio (OR) and 95% confidence interval (95% CI) SLE=Systemic Lupus Erythromatosus, HHV-8=human herpes virus 8, ACL= anticardiolipin antibody, LAC = lupus anticoagulant, ANA=antinuclear antibody, Anti ds-DNA= anti double stranded DNA.

Table (4): Frequency of Clinical Manifestations & treatment in HHV -8 (+) and HHV-8(-)among the SLE Patients

Clinical Data		HHV8		OR	95%CI	*P* value
Nephritis Positive, N (%) Negative, N (%)	 36/50(72%) 14/50(28%)	HHV 8 Positive, N (%) Negative, N (%)	 10/50(20%) 40/50(80%)	0.290	0.068–1.231	>0.05
Serositis Positive, N (%) Negative, N (%)	 30/50(60%) 20/50(40%)	HHV 8 Positive, N (%) Negative, N (%)	 10/50(20%) 40/50(80%)	0.600	0.149– 2.421	>0.05
Mucocutaneous Positive, N (%) Negative, N (%)	 44/50(88%) 6/50(12%)	HHV 8 Positive, N (%) Negative,N 9%)	 10/50(20%) 40/50(80%)	0.773	0.658-0.907	>0.05
2ry APS Positive, N (%) Negative, N (%)	 16/50(32%) 34/50(68%)	HHV 8 Positive, N (%) Negative, N (%)	 10/50(20%) 40/50(80%)	0.890	0.197-4.012	>0.05
Phsycosis Positive, N 9%) Negative, N (%)	 4/50(8%) 46/50(92%)	HHV 8 Positive, N (%) Negative, N (%)	 10/50(20%) 40/50(80%)	4.750	0.580-38.907	>0.05
Arthritis Positive, N (%) Negative, N (%)	 36/50(72%) 14/50(28%)	HHV 8 Positive, N (%) Negative, N (%)	 10/50(20%) 40/50(80%)	0.885	0.194-4.047	>0.05
Leucopenia Positive, N (%) Negative, N (%)	 14/50(28%) 36/50(72%)	HHV 8 Positive, N (%) Negative, N (%)	 10/50(20%) 40/50(80%)	2.000	0.467-8.557	>0.05
Azathioprine treatment Positive, N (%) Negative, N (%)	 26/50(52%) 24/50(48%)	HHV 8 Positive, N 9%) Negative, N (%)	 10/50(20%) 40/50(80%)	0.905	0.226–3.619	>0.05
Cyclophosphamide treatment Positive, N (%) Negative, N (%)	 16/50(32%) 34/50(68%)	HHV 8 Positive, N (%) Negative, N (%)	 10/50(20%) 40/50(80%)	2.636	0.637– 10.914	>0.05
Hydroxychloroqiune treatment Positive, N (%) Negative, N (%)	 44/50(88%) 6/50(12%)	HHV 8 Positive, N (%) Negative, N (%)	 10/50(20%) 40/50(80%)	0.773	0.658-0.907	>0.05
Clinical Data		HHV8		OR	95%CI	*P* value

* Statistically significant value (*P* <0.05), Chi Square: values are the odds, ratio (OR) and 95% confidence interval (95% CI), Leucopenia (leucocytes < 3000 x10^9/L), 2ry APS= secondary antiphospholipid syndrome, SLE = Systemic lupus erythematosus, HHV8= human herpes virus, N=number

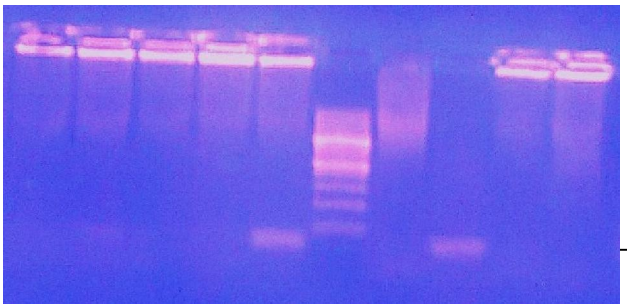

Figure (1) Agarose gel electrophoresis of HHV-8 DNA

Lane 6: 100 base pair DNA marker
Lane 5 & 8: HHV-8 DNA positive sample (160 bp)
Lane 1,2,3,4,7,9,10: HHV-8 DNA negative sample

4. Discussion

The herpes viridae family is a good candidate to play the role as an environmental factor in the pathogenesis of SLE (Sun et al., 2011). We designed our study to investigate the prevalence of HHV-8 in the blood of SLE patients and HC subjects from Egypt and also to study the relationship between HHV-8 presence and clinical SLE parameters.

In the present study we found 10% of SLE patients with positive HHV-8 versus 5% among the HC subjects. There was a statistically significant difference between the two studied groups. The association between HHV-8 and SLE has not been extensively studied and few reports are available. The published data on the association are by Sun et al. (2011) who measured HHV-8 DNA in serum by a nested PCR method, and found that HHV-8 was more prevalent in SLE patients (10.3%) compared to the control subjects (0.3%).

In our study the nested PCR method used for the detection of HHV-8 used was pointed out by (Andreoni et al., 2002 & Laurent et al., 2008), to be a very sensitive tool with low detection limit, also we used EDTA blood and not serum, as Sun et al. (2011) because of low copy number and intermittent presence of HHV-8 DNA in serum (Koelle et al., 1997; Edelman et al., 2005).

The prevalence of HHV-8 observed in SLE can be explained by the susceptibility of viral infection in patients with SLE. As a disorder with impairment of the immune system, SLE may lead to abnormalities of humoral and cell mediated immune responses, cytokine milieu and complement system. Furthermore, due to the application of immunosuppressant agents in routine treatment, patients with SLE may be predisposed to HHV-8 infection, thus resulting in a higher detection rate of HHV-8 infection. This predisposition has been observed in some transplant recipients and patients with autoimmune disease or malignancy who have received high dose of immunosuppressant agents (Sun et al., 2011).

Previous investigations have identified that HHV-8 encodes a large number of cellular homologs. For example, HHV-8 encodes viral interleukin-6 in B cells, resulting in B-cell survival and proliferation (Chandriani and Ganem, 2010; Chatterjee et al., 2002). Therefore, HHV-8 could be regarded as a superior candidate due to constant immune stimuli triggered by the lifelong latency itself.

In our study, the prevalence of HHV-8 among HC subjects (5%) which was compatible with the previously published data on the prevalence of HHV-8 among HC subjects. For example, in China HHV-8 prevalence was 7.3% in the study by Wang et al.. (2005) and 5.7% in the study by Mei et al. (2007). The prevalence of HHV-8 infection reported in the studies in China was similar to those among the adult population in North America by (Kedes et al, 1996; Blackbourn et al., 1997; Engels et al., 2007). HHV-8 seroprevalence among blood donors varies between different regions. HHV-8 prevalence ranges from 0.2% in Japan, 0-15% in the USA and the UK, up to >50% in some African countries (Antman and Chang, 2000; Baillargeon et al., 2001).

The study by Wang et al. (2010) suggested that HHV-8 seroprevalence was associated with ethnicity but not with sex, age, marital status, occupation, educational level, blood type, and time of donation of blood components. An intriguing possibility is that different cultural practices or social behaviors may play a part in HHV-8 infection. Alternatively, genetic factors may affect the susceptibility to HHV-8 infection. Emerging evidence suggests that HHV-8 may be transmitted through sexual contact (Martin et al., 1998; Engels et al., 2007), saliva (Pauk et al., 2000), and blood transfusion (Hladik et al., 2001).

To our knowledge, this is the first time that all HHV-8 is analyzed in an Egyptian population, the high HHV-8 prevalence observed might be a feature characteristic of this specific geographical area. The subjects are not homogeneous because historical records show that the Egyptian population is one that has undergone genetic admixture and racial mixing, which created a heavily mixed population of modern Egyptians including several ethnic groups such as Bedouins, Peasants, Nubians, Berbers, and urbanites (Shahin et al., 2011).

Although HHV-8 was detected in 10% of blood samples of SLE but our study failed to show any correlation between HHV-8 prevalence and SLE clinical parameters. This might indicate that HHV-8 do not play a significant role in the initiation of SLE. In addition, gene–environment interactions have been suggested to be relevant in the context of SLE (Wang et al., 2010). Eriksson et al. (2011) studied the autoantibodies predating the onset of symptoms in European SLE patients and related these autoantibodies to the first recognized symptoms.

Autoantibodies were compared in the HHV- 8 DNA (+) group (n = 10) versus the HHV- 8 DNA (-) group (n = 40). There were no associations between HHV-8 prevalence and auto-antibodies among the SLE patients. This may sound strange since most previous studies were focused on the role of viruses in inducing or enhancing auto-antibodies in SLE (Barzilai et al., 2007); however, viruses have various mechanisms to inhibit host immune function in order to survive and escape from elimination by the host immune system. In fact, viral anti-inflammatory and immune-modulating proteins have been applied to treat inflammatory and immune disorders (Munuswamg-Ramanujam et al.., 2006).

Sun et al. (2011) stated that several mechanisms have been proposed by which viruses trigger autoimmune diseases, including adjuvant effects, molecular mimicry, bystander activation and epitope spreading.

The screening of human herpes virus 8 in blood samples from SLE patients and HC, performed for the first time in the Egyptian population, showed a statistically significant difference in the prevalence of human herpes virus 8 among both studied groups. There was no association between HHV8 among the SLE studied patients and the clinical manifestations of SLE. Thus HHV8 might be an etiological factor for SLE.

Additional studies with larger sample size are recommended.

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