

## FREQUENCY OF ISOLATION AND TYPE CHARACTERISTICS OF HERPES SIMPLEX VIRUS IN VARIOUS CLINICAL FORMS OF HERPES

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*The isolation rate of herpes simplex virus (HSV) was investigated in relation to the stage of herpetic disease in 186 patients from the Varna region. It was proved that HSV was isolated most successfully during the first 1 - 2 days after the appearance of herpetic vesicles. Isolation of HSV in the later stages of the illness was rather difficult. An analysis of the correlation between the type of the isolated HSV and the location of the disease was performed, too. It was established that HSV-1 was isolated from all patients with labial and facial herpes, HSV-2 was isolated from patients with genital and gluteal herpes while both types were isolated from cases with herpes of the extremities. The earlier established correlation between the HSV type and location of the herpetic disease remains unchanged in Bulgaria in contrast to many European countries and USA*

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**Key-words:** Herpes simplex virus, isolation, type characteristics, clinical forms, Bulgaria

### INTRODUCTION

Relapsing herpes simplex with its well-known characteristic clinical features does not suggest specific diagnostic difficulties. However, if it is a question of atypic and abortive forms, genital or neonatal herpes, there is a necessity of actual virologic diagnosis. From diagnostic approaches preference is given to isolation of Herpes

simplex virus (HSV). The successful isolation of HSV depends on the stage of herpetic infection (1, 11). There exists a correlation between the type of isolated herpes strain and the location of herpetic infection although there are contradictory data about that (5, 7, 12). Therefore, the aim of our present study is to clarify all these questions.

### MATERIAL AND METHODS

Altogether 186 patients with herpes simplex in various clinical forms are studied in the Department of Microbiology

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and in the Department of Dermatology and Venereology of the Medical University, Varna. A total of 149 HSV strains are isolated from these patients. Highly sensitive diploid culture from embryonal lung (Pulmo) is used as biological test for HSV isolation. Liquid from patients' vesicles is taken for HSV isolation, whereas in later periods of the disease the material is taken from the secretion coming out of cut erosions (2, 12). Immediately after the material is taken the authors inoculate it into 4-5 tube cultures *ex tempore*. The cellular monolayer is analyzed 24 up to 48 - 72 hours. Usually, the typical cytopathic effect exerted by HSV is visualized at the 24<sup>th</sup> hour after infection: it is (or could be) oval-cellular, giant-cellular, syncithial, and small-cellular effect. This provides for better diagnosis of herpes infection even in the early phases of the disease (24-48 hours after inoculation of the material). Typing of newly-isolated viruses is done by virus-neutralizing reaction (1).

## RESULTS

The results from the virological analysis of our patients with herpes simplex show a considerably high percentage of HSV isolation (80,11 %). This value varies in regard to the corresponding clinical form. Higher incidence rate of viral isolation is registered for patients with facial herpes (in 91,18 %) and gluteal herpes (in 90,91 % of the cases). Incidence rate of viral isolation for patients with labial herpes and skin herpes of the extremities is relatively lower, i. e. in 80,65 % and 78,57 % of the cases, respectively. Genital herpes correlates with lowest frequency of isolation in the present study - in 76,04 % of the patients. There is a certain dependence between the stage of herpes infection and HSV isolation (8, 10). Isolation rate is highest in the first 1-2 days of the disease (up to 95,33 %) probably due to the presence of vesicles and erosions. However, in the next 3-5 days this value decreases down to about 60 % . Virus isolation in later periods of the disease is a difficult task and the results are

**Table 1**  
**Percentage of HSV isolation in various stages of herpes disease**

Stage of disease	Examined cases n	Isolated strains n	Isolation %
Initial 1-2 days vesicles or erosions	107	104	95,33
Initial 3-5 days erosions or vesicles	75	45	60,00
Later stages	4	-	-
Total	186	149	80,11

## Frequency of Isolation and Type Characteristics of Herpes Simplex Virus...

**Table 2**  
**Isolation and type distribution of herpes viruses according to clinical forms**

Clinical forms	Patients		Isolated viruses		Isolation %	Type characteristics		
	n		n			HSV-1	HSV-2	none
Labial herpes	31		25		80,65	13	-	12
Facial herpes	34		31		91,18	17	-	14
Herpes of extremities	14		11		78,57	1	4	6
Gluteal herpes	11		10		90,91	-	5	5
Genital herpes	96		72		76,04	-	36	36
Total	186	149	80,11		31 45 73			

often negative. Therefore, it is recommended that the virological examination should be performed in the first 1 - 2 days (Table 1).

According to our results, HSV, type 1 (HSV-1) is isolated from all cases with labial and facial herpes, while HSV, type 2 (HSV-2) is isolated from the cases with genital and gluteal herpes; as for the herpetic process on the extremities the viral strains isolated are HSV-1 and HSV-2 (Table 2). Thus, for example, the isolated viruses from labial herpes patients are HSV-1 mainly (in 99,70 %) of the cases) while the rest cases (0,30 %) show a mean type (between 1 and 2).

### DISCUSSION

It is known from the literature available that certain correlation between the type of isolated HSV and location of herpetic process is established. As a rule, HSV-1 develops labial, facial, and ophthalmic herpes as well as herpes stomatitis and major part of the infections of the central nervous system. The reason for genital

herpes, skin herpes of gluteus and extremities as well as neonatal herpes is HSV-2. For example, according to the data of several investigators (5, 8, 12), HSV-2 is isolated rather oftener from cases with genital herpes (in 85-90 % of the patients). Our data coincide with these of other Bulgarian authors (2) who report an isolation rate of 98,0 % of HSV-1 from patients with labial herpes while that of HSV-2 is 1,25 % only. The mean type is isolated in 0,75 % of the cases only.

However, according to the recent USA and West-European studies, it is stated that more commonly and commonly, the authors register herpes keratitis, pharyngitis and keratopharyngitis caused by HSV-2, and, on the contrary, neonatal and genital herpes caused by HSV-1 (4, 6, 7). Some authors' data (4, 5, 9) indicate that HSV-1 is isolated from patients with genital lesions as follows: in 7,13 % (Boston, MA, USA), in 22,00 % (Edinburgh, UK), and in 61,30 % (Sheffield, UK). These authors conclude that there is no more correlation between the location of the lesions and the type of

isolated virus. With the more widely used practice of orogenital sexual contacts there is no surprise why HSV-1 is commonly isolated from genitals. Our data, however, along with the data of other Bulgarian specialists (2), demonstrate that in the region covered by this study there is no change in the correlation between the

location of lesions and type of isolated virus. Most probably, the reason consists in rarer deviations in the way of sexual contacts. Future investigations regarding this speculative conclusion would provide for better analysis of what could happen for the same correlation.

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### **Häufigkeit der Isolierung und Charakterisierungstyp des Herpes simplex Viruses bei verschiedenen klinischen Formen der Herpes-Krankheit**

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**Zusammenfassung:** Die Häufigkeit der Isolierung des Herpes simplex Viruses (HSV) wurde im Zusammenhang mit der Entwicklungsstufe der herpetischen Erkrankung bei 186 Kranken aus dem Bezirk von Varna untersucht. Es wurde festgestellt, daß das HSV am erfolgreichsten in den ersten 1 - 2 Tagen nach der Erscheinung der herpetischen Vesikeln isoliert wurde. Die Isolierung des HSV in den späteren Stadien der Erkrankung war recht schwierig. Außerdem wurde eine

Analyse des Zusammenhanges zwischen dem Typen des isolierten Virus und der Lokalisation der Herpes-Schädigung durchgeführt. Es wurde nachgewiesen, daß das HSV-1 von allen Patienten mit einem labialen und fazialen Herpes, das HSV-2 von den Kranken mit einem genitalen und glutealen Herpes, während beide Typen des HSV von Patienten mit einem Herpes der Glieder isoliert worden waren. Die früher beobachtete Korrelation zwischen dem Typen des HSV und der Lokalisation der herpetischen Erkrankung bleibt in Bulgarien zum Unterschied von den meisten europäischen Ländern und den Vereinigten Staaten Amerikas unverändert.

### **Fréquence d'isolement et de caractéristique des types du virus de l'herpès simplex dans les différentes formes cliniques du herpès**

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**Résumé:** On a étudié la fréquence d'isolation du virus de l'herpès simplex (VHS) selon le stade de la maladie sur 186 malades de la région de Varna. On a constaté que le VHS peut être isolé avec un grand succès pendant le 1-2 jour après l'apparition de la vésicule de l'herpès. L'isolement du virus de l'infection dans les phases plus avancées de la maladie est plus difficile. On a étudié aussi la dépendance entre le type du virus isolé et la localisation de l'atteinte d'herpès. Lors de la étude faite ces malades d'herpès simplex, dans tous les cas d'herpès labial et facial on a isolé le VHS - 1<sup>er</sup> type, chez l'herpès génital et gluteal - le VHS - 2<sup>ème</sup> type et chez l'herpès de la peau et des extrémités - le VHS - 1<sup>er</sup> ou le VHS - 2<sup>ème</sup> type. A la différence de beaucoup de pays d'Europe et des Etats-Unis d'Amérique, en Bulgaie, chez les malades d'herpès simplex on n'observe pas une corrélation à la dépendance déjà établie entre le type du VHS et la localisation de l'atteinte d'herpès.