

HSV e Banche degli Occhi

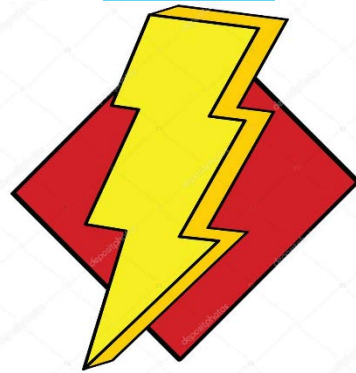
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XIII Corso Società Italiana Banche degli Occhi

Bologna, 1 giugno 2019

LA NOTIFICA DEL CHIRURGO





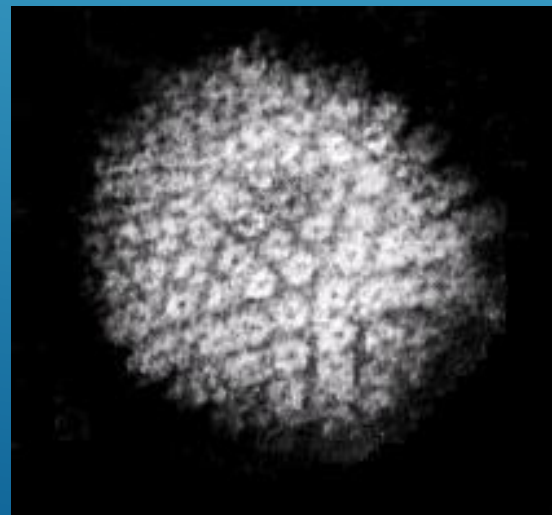
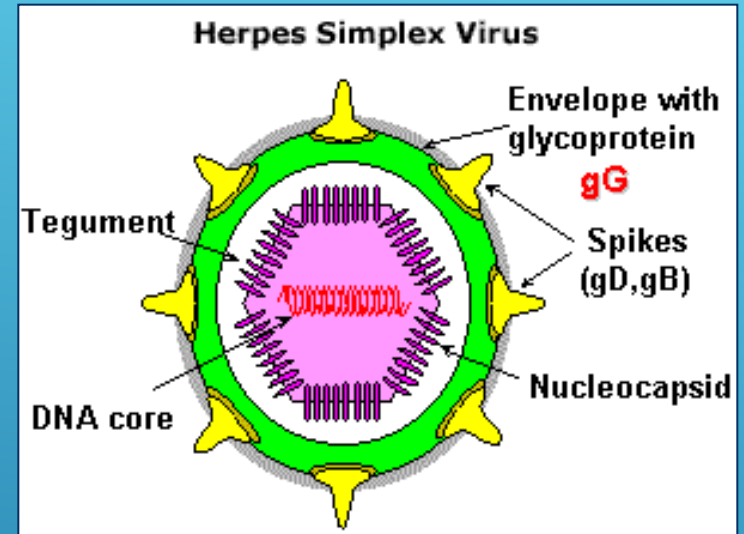
**KEEP
CALM
AND
STUDY
HERPES**

A grayscale photograph of a scientist in a lab coat and hairnet looking through a microscope in a laboratory setting. The scientist is wearing a white lab coat and a white hairnet. They are looking through the eyepieces of a microscope. The background is a laboratory with various pieces of equipment. The word "EPIDEMIOLOGIA" is overlaid in the center of the image.

EPIDEMIOLOGIA

Herpes Simplex Virus 1 e 2

- DNA a doppio filamento
- Capside icosaedrico
- Famiglia Herpesviridae:
Varicella Zoster,
Epstein-Barr,
Cytomegalovirus



Epidemiologia

- HSV infetta solo gli esseri umani ed è endemico in ogni comunità umana.
- Differenti polimorfismi nel DNA di HSV caratterizzano diversi gruppi etnici.

Herpes Simplex Virus Epidemiology and
Ocular Importance

Thomas J. Liesegang, M.D.

Cornea 20(1): 1-13, 2001.

Epidemiologia

- Il DNA di HSV-1 può essere rilevato mediante PCR nel trigemino del 18,2% dei cadaveri fino a 20 anni di età. Nelle persone dopo i 60 anni il riscontro positivo è prossimo al 100%.
- La prevalenza stimata dell'infezione da HSV-1 è di circa 150 casi ogni 100.000 abitanti.

**Herpes simplex virus
infection in the media
of donor corneas during
organ culture:
frequency and
consequences**

ULRIKE SENGLER, THOMAS REINHARD,
ORTWIN ADAMS, CATHARINA KREMPE,
RAINER SUNDMACHER

Eye (2001) 15, 644–647 © 2001 Royal College of Ophthalmologists

Comportamento

- HSV-1 è isolato prevalentemente (ma non esclusivamente) nei gangli del trigemino (infezioni orofacciali) e HSV-2 prevalentemente nei gangli sacrali (infezioni genitali).
- L'apparente tropismo di HSV è determinato dalla presenza di fattori locali che favoriscono le recidive di HSV-1 nell'area facciale e HSV-2 nell'area genitale.

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Cheratiti erpetiche da HSV-1



Ulcera epiteliale
(colorazione con fluorescina)

- HSV-1 si replica nelle cellule epiteliali, endoteliali e nei cheratociti.
- Lo stress pre-mortem può riattivare il virus latente nel trigemino e promuovere la diffusione virale nella cornea del donatore.



HSV
&
BANCHE DEGLI OCCHI

Cornee da donatore

- 10/24 HSV-1 DNA rilevato mediante PCR.
- 0/24 HSV-1 isolato nel modello animale.

J Med Virol. 1995 May;46(1):75-80.

Herpes simplex virus DNA in normal corneas: persistence without viral shedding from ganglia.

Openshaw H¹, McNeill JI, Lin XH, Niland J, Cantin EM.

Cornee da donatore

- 2/83 HSV-1 350-bp DNA rilevato mediante PCR.
- 0/83 HSV-1 isolato in colture cellulari Vero.

[Jpn J Med Sci Biol.](#) 1997 Aug-Oct;50(4-5):151-60.

Screening of human corneas for herpes simplex virus by tissue culture and polymerase chain reaction.

[Biney EE¹](#), [Orrett FA](#).

Liquidi di conservazione

- 7/451 HSV-1 DNA rilevato mediante PCR.
- 0/7 cornee evidenziano perdita/necrosi di cellule endoteliali o alterazioni morfologiche.

J Med Virol. 1997 Jul;52(3):320-5.

Low rate shedding of HSV-1 DNA, but not of infectious virus from human donor corneae into culture media.

Garweg JG¹, Boehnke M.

Liquidi di conservazione

- 3/80 HSV-1 DNA rilevato mediante PCR.
- 0/80 HSV-1 isolati in colture cellulari Vero.
- 0/3 infezioni erpetiche post operatorie.

British Journal of Ophthalmology 1996;**80**:654–657

Detection of herpes simplex virus DNA in donor cornea culture medium by polymerase chain reaction

David J Morris, Graham M Cleator, Paul E Klapper, Robert J Cooper, Emmanuel O E Biney, Carol Dennett, Boris Marcyniuk, Andrew B Tullo

Liquidi di conservazione

- 12/112 HSV-1 DNA rilevato con PCR in cornee con mortalità endoteliale >50% su 199 cornee non idonee.
- 7/12 HSV-1 DNA + confermati in coltura HeLa.
- 0/117 HSV-1 DNA rilevato con PCR in cornee con mortalità endoteliale ≤50% o idonee per trapianto.

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HSV-1 e conservazione a 31-37°C

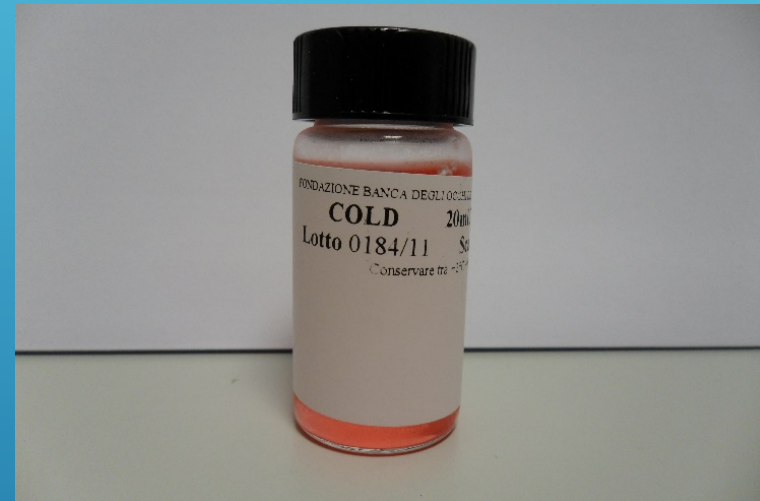
Nella cornea conservata a 31-37°C, HSV-1 si replica come nelle colture cellulari e induce necrosi nell'epitelio e nell'endotelio.

La necrosi endoteliale è rilevabile mediante colorazione con trypan blue.



HSV-1 e conservazione a 4°C

La replicazione del virus si verifica anche nella cornea conservata a 4°C, ma al momento dell'esame in banca degli occhi potrebbe non essere evidente la necrosi endoteliale.





CONCLUSIONS

Corneal Donor Infection by Herpes Simplex Virus: Herpes Simplex Virus DNA in Donor Corneas

G.M. Cleator, M.Sc., Ph.D., P.E. Klapper, Ph.D., MRCPATH, C. Dennett, M.Sc., A.L. Sullivan, B.Sc.(Hons), R.E. Bonshek, M.D., Ch.M, MRCPATH, B. Marcyniuk, M.Sc., Ph.D., and A. B. Tullo, M.D., FRCophth

Three corneoscleral discs (from two donors) underwent subtotal endothelial loss during routine "long-term" organ culture storage. Laboratory studies of these corneas revealed evidence of herpes simplex virus (HSV) infection of the graft to a patient with keratoconus. Debridement of the cornea from one of the donors had been performed at 2 months and was shown to be infected with HSV. In an experiment designed to simulate "cleansing" of donor globes, 0.1% polyvinylpyrrolidone (PVP) protected cells from infection with HSV. It was explained that the detection of HSV in these corneas was due to external contamination of the corneas. Furthermore, culture of conjunctival and corneal cells taken from 47 consecutive donors confirmed that HSV is rarely isolated at or around the time of transplantation of donor corneas destined for use in keratoconus. HSV DNA was detected by polymerase chain reaction (PCR) in tissue from two of the donors. These observations suggested that the presence of HSV in tissue from two of the donors was not due to severe endothelial loss of the donor corneas and possibly provide an alternative explanation for the presence of HSV in donor corneas.

The majority of donor corneas used in the U.K. is now maintained in long-term (up to 30 days) organ culture storage prior to being utilised in transplantation (1). Long-term storage carries considerable logistical advantages both in allowing time for screening of donor serum (for human immunodeficiency virus, and hepatitis B and C virus infection) prior to transplant and in terms of the efficient scheduling of transplant procedures. Bacterial and fungal infection of the donor cornea and subsequent transmission to the transplant recipient is minimised by the initial "cleansing" of the donor eye with povidone-iodine, and long-term culture at 34°C is likely to reveal any residual infection prior to transplantation. An endothelial cell count of <2,000 cells leads to the discard of up to 15% of donor corneas stored in the Marrow Bank (unpublished data).

SCIENTIFIC REPORT

Penetrating keratoplasty: indications and contraindications

N Al-Yousuf, J Bhatnagar, S M Daya

... the most common indication for PK was keratoconus (72%). ... followed by Fuchs' dystrophy (15.5%). ... analysis of all cases revealed that a statistically significant proportion of patients who underwent PK of our procedures performed in this period were reviewed retroactively for evaluation (72%).

RESULTS

Of the 284 cases performed, 12% were performed for visual reasons, 5% for threatened perforation (n=43, 5.5%). Only 1% of the remaining cases were bacterial in origin. In the five remaining cases the reasons for visual reasons were:

| Reason | Number of Cases |
|------------------------|-----------------|
| Threatened perforation | 43 (5.5%) |
| Other visual reasons | 17 (6%) |
| Bacterial infection | 5 (1.7%) |
| Other reasons | 117 (41%) |

Of the 284 cases performed, the mean patient age was 54.21 years (range 18-82) and a median of 56 years. The majority of diagnoses were refractive errors (n=125, 44%) and endothelial dysfunction (n=25, 8.8%). Bullous keratopathy was the most common diagnosis (n=10, 3.5%).

Regrabs 40.9%

Come possiamo prevenire la trasmissione delle infezioni erpetiche?

Prevenzione relativa al donatore

- Ispezione fisica del donatore
- Esclusione dei donatori con storia clinica (recente o passata) di cheratite erpetica
- La disinfezione accurata della cornea del donatore con I-PVP prima del prelievo inattiva rapidamente HSV

Prevenzione relativa alla selezione dei tessuti in banca

- Eliminare le cornee con necrosi endoteliale diffusa e/o difetti epiteliali ed eliminare anche le cornee controlaterali, anche se idonee per il trapianto

Come possiamo prevenire la trasmissione delle infezioni erpetiche?

La conservazione dei tessuti corneali a 31-37°C rappresenta un "metodo di screening" per rilevare la replicazione di HSV-1 attraverso l'effetto citopatico (alterazioni morfologiche e/o necrosi cellulare).

La trasmissione di HSV da donatore a ricevente può essere esclusa attraverso un'accurata valutazione dell'endotelio in cornee conservate a 31-37°C prima della distribuzione.

Grazie per l'attenzione!



**FONDAZIONE
BANCA DEGLI OCCHI
DEL VENETO**
O. N. L. U. S.

