Summary code for ocular herpes simplex

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Herpes simplex virus is a major cause of serious eye disease. Despite advances in antiviral therapy many patients experience exacerbations of the disease with progressive deterioration in their condition requiring frequent and long-continued ophthalmic attention. The resulting morbidity and loss of work constitutes a major social and economic disruption.

The character of herpetic disease may change in different directions in different patients over a period of time. Many patterns of disease are possible; but at present there is no way of predicting which patients presenting with dendritic ulceration are at particular risk of developing disciform keratitis, recurrent ulceration, corneal abscess formation, or herpetic uveitis.

The sequential pattern of herpetic disease is important in assessment of the individual patient and in determining correct management at each point: it probably also has prognostic and epidemiological significance and may be related to the type of herpes virus or even to strain differences in the agent.

The complexity and diversity of possible sequences and combinations of events have hitherto made it difficult to comprehend the entire historical pattern of each patient's case, and exceedingly difficult to communicate a grasp of each case to other clinicians, or to analyse large-scale data for the existence of sequential patterns.

To overcome these difficulties in assessment and obstacles to communication we have devised a simple coding of the main morphological variants of herpetic disease, its treatment and complications. This code makes it easy to maintain a progressive summary of each case and greatly facilitates the rapid evaluation of essential data, at each decision-making point during management. Furthermore, it offers considerable facility in recording, analysing, and communicating the complex historical data to others.

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Code and definitions

A. HERPETIC LESIONS OF VARIOUS MORPHOLOGY

1. *Skin*

- LV — typical herpetic lid vesicles
- SV — typical herpetic skin vesicles occurring beyond the lids.

2. *Conjunctiva*

- HC — herpetic conjunctivitis
An acute follicular conjunctivitis with regional lymphadenopathy. Frequently with SV (skin vesicles) or LV (lid vesicles) and sometimes a superficial punctate keratitis.

3. *Superficial cornea*

- HPK — herpetic punctate keratitis
Fine granular epithelial spots which coalesce to form irregularly-shaped lesions which stain with fluorescein. Frequently with subepithelial infiltration
- AU — amoeboid ulcer
This is an irregularly lobulated extensive but frequently shallow ulcer with a minimum width of 2 mm. The edges are irregular and sharply defined, and the surrounding epithelium is opaque. The base of the ulcer is yellowish-grey and the stroma shows varying degrees of infiltration and oedema. There is always an associated uveitis, often with a hypopyon. The edges of the ulcer stain with rose Bengal, and the base with fluorescein
- AUS — amoeboid ulcer treated with steroids in the past week
- DU — dendritic ulcer
This is a characteristic zig-zag, linear, or complicated arborescent ulcer typically less than 1 mm broad, with an irregular sharply

- defined edge and bead-like nodes at the end of the branches. The epithelium at the edge of the ulcer is typically opaque and swollen, and there is a varying amount of stromal haze and uveitis. The edge of the ulcer stains with rose Bengal, while the ulcer itself stains with fluorescein
- DUS — dendritic ulcer treated with steroids in the past week
- DURC — dendritic ulcer, recrudescent
A recrudescent ulcer is one that reappears at the site of a previous ulcer within 14 days of healing
- DURR — dendritic ulcer, recurrent
A recurrent ulcer is one that appears more than 14 days after healing of a previous ulcer
- MAU — herpetic marginal ulcer
A round, oval, or irregular ulcer near the limbus, the edges of which resemble those of dendritic or amoeboid ulcers. It is normally associated with considerable stromal infiltrate and conjunctival hyperaemia which does not resemble in history or appearance a 'straphylococcal marginal ulcer' and which responds to antiviral agents
- MHU — metaherpetic ulcer
An indolent round or oval ulcer with smooth sloping borders that do not stain with rose Bengal, occurring in a hypoaesthetic cornea overlying an area of stromal disease. There is a past history of herpetic disease. Virus cultures are typically negative
- LU — linear ulcer
A non-arborescent straight or curved ulcer staining brightly with rose Bengal.

4. Corneal stroma, uvea and sclera

- DK — disciform keratitis (herpetic)
A central localized disc-shaped stromal keratitis occurring typically after superficial herpetic ulceration, or as a primary event in the absence of other systemic disease such as zoster, varicella, vaccinia, or mumps. The associated anterior uveitis may be very mild or severe
- DKU — disciform kerato-uveitis
Disciform keratitis with more than 1+ flare and 1+ cells in the anterior chamber

- HSK — herpetic stromal keratitis
A generalized or irregular non-disc-shaped deep keratitis almost always following herpetic ulceration. It is usually eccentrically sited in the cornea but may be very extensive. Deep stromal vascularization frequently develops
- HSKU — herpetic stromal kerato-uveitis
Herpetic stromal keratitis with more than 1+ cells and 1+ flare in the anterior chamber
- HCA — herpetic corneal abscess
Dense opaque white or yellowish infiltrate after herpetic stromal keratitis or disciform keratitis
- HU — herpetic uveitis
Anterior uveitis, often severe, occurring in an eye with a history of past herpetic disease but currently no active keratitis
- HSC — herpetic episcleritis or scleritis
Scleral or episcleral inflammation occurring in sectional or generalized pattern in association with or following known, and active, herpetic kerato-uveitis.

5. Associated conditions

- IOP — intraocular pressure above 30 mmHg during an episode of herpetic disease
- DE — dry eye
Diminution of aqueous tear production, frequently associated with drug toxicity (McGill, Williams, McKinnon, Holt-Wilson, and Jones, 1974)
- CAT — cataract
Secondary cataract after episodes of herpetic kerato-uveitis
- AMB — amblyopia
Amblyopia after herpetic corneal disease in childhood
- FK — filamentary keratopathy
Epithelial filaments after herpetic corneal disease
- PDT — presumed drug toxicity
Presumed drug side-effects (for example, cataract) not otherwise categorized
- MIS — miscellaneous
Any ocular sign not otherwise categorized which is thought to be due to herpetic infection (for example, iris atrophy).

B. MANAGEMENT

1. Drug treatment

- S — steroid
Treated with topical steroids
- IDU — treated with Idoxuridine (IDU)
- IDUT — IDU toxicity
An eye treated with IDU, usually for at least 10 days (but the period can be shorter if treatment is very intensive or if IDU treatment has been used on previous occasions), which demonstrates one or more of the following (McGill and others, 1974; Patterson and Jones, 1967):
- lid — ptosis
 - lid margin — keratinization
 - rounded edge
 - Meibomian orifice occlusion
 - punctum — narrowing or occlusion
 - limbus — follicles or oedema
 - conjunctiva — punctate epithelial disease, characteristically in the interpalpebral fissure, staining with rose Bengal
 - cornea — punctate epithelial keratopathy
 - flaking opaque epithelium, staining with rose Bengal
 - microcysts, some staining with fluorescein
 - sub-epithelial opacification and vascularization (changes aggregate in a curved or linear fashion with whorl-shaped patterns of epithelial keratopathy)
 - indolent corneal ulcer — developing usually from a linear pattern of punctate keratopathy. It may thus somewhat resemble a dendritic ulcer and may progress to resemble a metaherpetic ulcer.
- There is marked associated punctate epithelial keratopathy.

IDUR — IDU resistance

An ulcer adequately treated with IDU which:

1. is getting worse after 4 days, or is static after 7 days, or is changing shape but not healing by 10 days
2. shows no sign of IDU toxicity
3. has no significant underlying active infiltrate

IDUH — IDU hypersensitivity

Contact dermatitis of the lids after IDU application to the eye

F₃T — treated with trifluorothymidineF₃TT — F₃T toxicity

An eye treated with F₃T which demonstrates one or more of the following (McGill and others, 1974):

- punctum — narrowing
- conjunctiva — punctate epithelial disease, characteristically in the interpalpebral fissure, staining with rose Bengal
- cornea — punctate epithelial keratopathy
- epithelial microcysts
- epithelial oedema

(Other toxic signs may be recognized as clinical experience with F₃T grows. The time required for toxicity to develop is not yet defined)

F₃TR — F₃T resistance

An ulcer adequately treated with F₃T which:

1. is getting worse after 4 days, or is static after 7 days, or is changing shape but not healing by 10 days
2. shows no sign of F₃T toxicity
3. has no significant underlying active infiltrate

F₃TH — F₃T hypersensitivity

Contact dermatitis of the lids after F₃T application to the eye

AA — treated with adenine arabinoside

AAT — Ara-A toxicity

An eye treated with Ara-A which demonstrates one or more of the following:

- conjunctiva — punctate epithelial disease, characteristically in the interpalpebral fissure, staining with rose Bengal

cornea — punctate epithelial
keratopathy

(Other toxic signs may be recognized as clinical experience with Ara-A grows. The time required for toxicity to develop is not yet defined)

AAR — Ara-A resistance

An ulcer adequately treated with Ara-A which:

1. is getting worse after 4 days, or is static after 7 days, or is changing shape but not healing by 10 days
2. shows no sign of Ara-A toxicity
3. has no significant underlying active infiltrate

AAH — Ara-A hypersensitivity

Contact dermatitis of the lids after Ara-A application to the eye. (We have not recognized hypersensitivity to Ara-A to date.)

2. Physical treatment

DB — debridement

Simple removal of the ulcerated epithelium

CA — carbolization

Removal of the ulcerated epithelium followed by application of phenol

ID — iodization

Removal of the ulcerated epithelium followed by application of iodine

CY — cryotherapy

Application of a cryoprobe to the ulcer and surrounding area.

3. Surgery

CF — conjunctival flap

TA — tarsorrhaphy

PKP — penetrating keratoplasty

LKP — lamellar keratoplasty

AR — allograft reaction

4. Contact lens

SCL — 'soft' (hydrophilic) contact lens

HCL — haptic contact lens

C. CLINICAL STUDIES

1. RES — research

Patients entered into clinical drug trials or other research projects (Designated RES₁, RES₂, etc.)

Method of use of the code

Patients with herpetic ocular disease are classified according to the code and this coded summary is recorded on the cover of their case notes.

The codes relating to each significant episode of disease or treatment are recorded on a separate line opposite the date of start and finish of treatment.

For example, Fig. 1 designates a patient with three significant episodes. An initial dendritic ulcer was treated with Idoxuridine. During the course of this illness kerato-uveitis developed and the patient was treated with steroids. After a further bout of kerato-uveitis a penetrating keratoplasty was performed. A dendritic ulcer developed during treatment with steroids and IDU toxicity necessitated a change of therapy to F₃T, with the ulcer finally resolving.

Each patient's codes are recorded on punch cards. Fig. 2 shows a punch card for the above patient. Punch cards are updated from line to line, thus the codes for the first two episodes of disease have been transferred as indicated on the right-hand column of Fig. 1.

On the reverse side of each punch card code data are recorded in the same manner as Fig. 1. Thus all code information relevant to a patient is recorded in one place. Retrieval of data is simplified and the system allows for future elucidation of associated features or patterns.

Discussion

A continuing problem for ophthalmologists treating herpetic eye disease is the difficulty in relating

HERPES SIMPLEX CODE			
Name: John Citizen		Hospital No. N.2001	
Start treatment	Code	Finish treatment	Punch Coded
4/3/73	DU/IDU/HSKU/S	14/5/73	✓
12/10/73	HSKU/S	24/11/73	✓
12/2/74	PKP/DUS/IDUT/F ₃ T	22/2/74	

FIG. 1 *Herpes simplex code*

AA	— treated with Ara-A	HCA	— herpetic corneal abscess
AAH	— Ara-A hypersensitivity	HCL	— haptic contact lens
AAR	— Ara-A resistance	HPK	— herpetic punctate keratitis
AAT	— Ara-A toxicity	HSC	— herpetic episcleritis or scleritis
AMB	— amblyopia	HSK	— herpetic stromal keratitis
AR	— allograft reaction	HSKU	— herpetic stromal kerato-uveitis
AU	— amoeboid ulcer	HU	— herpetic uveitis
AUS	— amoeboid ulcer, steroid treated	ID	— iodization
CA	— carbolization	IDU	— treated with IDU
CAT	— cataract	IDUH	— IDU hypersensitivity
CF	— conjunctival flap	IDUR	— IDU resistance
CY	— cryotherapy	IDUT	— IDU toxicity
DB	— debridement	IOP	— raised intraocular pressure
DE	— dry eye	LKP	— lamellar keratoplasty
DK	— disciform keratitis	LU	— linear ulcer
DKU	— disciform kerato-uveitis	LV	— lid vesicles
DU	— dendritic ulcer	MAU	— marginal ulcer
DURC	— dendritic ulcer recrudescent	MHU	— metaherpetic ulcer
DURR	— dendritic ulcer recurrent	MIS	— miscellaneous
DUS	— dendritic ulcer, steroid treated	PDT	— presumed drug toxicity
FK	— filamentary keratopathy	PKP	— penetrating keratoplasty
F ₃ T	— treated with F ₃ T	RES	— research
F ₃ TH	— F ₃ T hypersensitivity	S	— treated with steroid
F ₃ TR	— F ₃ T resistance	SCL	— 'soft' contact lens
F ₃ TT	— F ₃ T toxicity	SV	— skin vesicles
HC	— herpetic conjunctivitis	TA	— tarsorrhaphy

FIG. 3 *Code summary in alphabetical order*

significant events in the patient's past to his current problems. This difficulty is compounded when several clinicians are caring for the same patient.

Since the introduction of our coding system in a busy clinic for virus diseases, all clinicians concerned have been impressed by the way in which it facilitates clinical assessment of cases. A glance at the patient's code summary allows one to grasp important features of his past history and present situation, even if the patient is unfamiliar to the ophthalmologist.

We have the impression that a patient's history influences the way in which a new episode of disease presents, progresses, and responds to treatment. Use of this code and the punch card or computerized cross-reference system should help to elucidate

possible patterns in evolution of disease, correlations in response to therapy, or otherwise unnoticed possible adverse effects of therapy.

Summary

A code for herpetic eye disease is presented. This simplifies the management of individual patients, and the up-to-date code summary of each case is easily maintained thus facilitating assessment of interrelating factors. It is suggested that the pattern of herpetic eye disease may have prognostic and epidemiological significance. This system has simplified retrieval of such data.

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References

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