The use of urokinase in the anterior chamber of the eye

DERMOT PIERSE AND HYLTON LEGRICE

From the Croydon Eye Unit, London

The anterior chamber of the human eye is a space bounded in front by the cornea and behind by the iris and lens. It is normally occupied by aqueous humour, approximately 0·25 ml. in volume with a viscosity of 1·02 to 1·04 and an albumin:globulin ratio of 1:1. Aqueous humour is produced by the ciliary body, passes through the pupil, and all but a very small proportion leaves the anterior chamber by passing through the trabecular mesh work in the angle between the cornea and the iris to the canal of Schlemm. From there it goes to the venous system. One per cent of the aqueous humour within the anterior chamber leaves it each minute.

Injury to the eye frequently results in bleeding into the anterior chamber termed hyphaema. The origin of this traumatic haemorrhage is the ciliary body, a fact which has been confirmed by various workers, and recent studies have shown that absorption of hyphaema is predominately via the trabecular mesh work. Provided the particulate matter suspended in the aqueous, in this case blood, is small enough, it will be carried to the canal of Schlemm.

Secondary glaucoma is a serious complication of total hyphaema, in which the anterior chamber is filled with clotted blood, and is due to the angle of outflow being obstructed by this clot. It frequently follows the secondary haemorrhage which occurs in many of these injuries about five days after the initial trauma. It is this rise in tension in the eye which is responsible for the poor visual outcome of many of these cases of ocular injury. The treatment available in the past has been limited.

Scheie, Ashley, and Burns (1963) described the successful treatment of eight cases of traumatic total hyphaema with secondary glaucoma by irrigation with fibrinolysin (Thrombolysin).

We have studied the effects of urokinase in eight cases of haemorrhage of the anterior chamber using comparatively small quantities of urokinase (5,000 to 25,000 units) to irrigate the anterior chamber. In all of these cases considerable lysis of the clot was noted at operation. Compared with lysis in vitro which took much longer, dissolution of the clot began in about two minutes. This fact may be due to the smaller volume of the blood clot in the anterior chamber compared with that in a test tube, and also because the irrigating cannula is moved through the clot during surgery. In five of these cases the hyphaema was associated with secondary glaucoma and lysis was sufficient to clear the angle of enough blood to allow adequate outflow of aqueous humour to bring back to normal the intraocular tension.

A further notable feature of this small series was that although irrigation was not persisted with until all the clot was lysed, some urokinase was left in the anterior chamber and further dissolution occurred over the next 24 hours. In the eighth case bleeding again occurred two days post-operatively and although irrigation was repeated a week later the result was not satisfactory.

In a further five cases urokinase was used to irrigate the anterior chamber when bleeding occurred during surgery and where the clot was extensive enough to interfere with surgical procedures. In these five cases it was noted by observation with the operating microscope that lysis at the edge of the clot began within a minute and continued until it was complete.

We feel that urokinase offers a satisfactory method of removing clotted blood from the anterior chamber of the eye and is a useful addition to the treatment of haemorrhage in the anterior chamber.

REFERENCE

The use of urokinase in the anterior chamber of the eye

Dermot Pierse and Hylton Legrice

J Clin Pathol 1964 17: 362
doi: 10.1136/jcp.17.3.362

Updated information and services can be found at:
http://jcp.bmj.com/content/17/3/362.citation

These include:

Email alerting service
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/