

Newsdesk

Hyperviscosity, diabetes, and fibrinogen

A new technique for reducing plasma viscosity is to be tested in clinical trials in Europe and the United States. Selective elimination of fibrinogen, fibrin, and fibrin degradation products (which are considered to be major contributors to plasma viscosity) from the plasma will be achieved by passing the patient's plasma over a matrix coated with the synthetic peptide Gly-Pro-Arg-Pro-Lys, a selective binder of these blood components. The plasma is immediately returned to the patient and the level of fibrinogen removal can be controlled by instant measurement of the fibrinogen levels. Successful treatments register levels of around 50 mg/dl amounting to 90% removal of the plasma fibrinogen. Initial trials are aimed at patients with leg ulcers and poor peripheral circulation, particularly those patients at risk of lower limb amputations. However, if the trials are successful an obvious application, according to Professor Werner Richter of the Research Institute of Lipid Metabolism and Haemorheology in Munich, is in patients with retinal vascular occlusions, particularly those with venous thrombosis in which previous studies have shown an association with plasma viscosity and reduced fibrinolytic activity (Williamson *et al*, *BJO* 1996;80:203-8).

Korsakoff's psychosis

A recent report in the industry newspaper *Laboratory News* (9 August issue) stated that a small region of the city of Glasgow, Scotland, has the world's highest incidence of Korsakoff's psychosis, a rare condition characterised by retrograde and anterograde amnesia and confabulation, and linked to a very high consumption of beer (around 200 units or 100 pints) per week. Korsakoff's psychosis is preceded by Wernicke's encephalopathy in which symptoms of confusion, ocular muscle paresis, and unsteadiness of gait are prominent. Apparently the condition is precipitated by lack of vitamin B1, an essential requirement for the metabolism of the high doses of carbohydrate associated with beer. While Wernicke's encephalopathy is reversible with the vitamin, Korsakoff's psychosis is not.

Images from a lensless camera

Three dimensional images of objects have been produced by a new imaging system based on computer analysis of light waves reflected from the object as cones of light, some of which interfere with each other and others which amplify the effects, until they strike a two dimensional sensor array linked to the computer. Each pixel of light which hits the array is then analysed by light intensity and the image built up by working backwards to determine the location of each point of light. The device was recently reported in the journal *Science* (1999;284:2164-6) and the effects are similar to a hologram except that this device uses non-coherent light as opposed to coherent laser light.

Control Delivery Systems

Since the first surgically implanted intraocular device for delivery of ganciclovir in the treatment of AIDS was approved by the Food and Drug Administration, in the United States in 1996, the use of this technology for the treatment of other conditions has been developed further. Control Delivery Systems (Waterton, MA, USA) in collaboration with Bausch and Lomb (Rochester, NY, USA) has plans to produce similar devices for the treatment of uveitis, diabetic retinopathy, particularly macular oedema, and age related macular degeneration using an implantable, refillable device.

Colour constancy

The phenomenon of colour constancy is well recognised in studies of visual perception and is described by Anya Hurlbert as a "fundamental stabilising mechanism that compensates for changes in the light source in order to keep object colours constant" (see review by Hurlbert, *Current Biology* 1999;9:R558-61). Colour constancy depends on both the reflectance of the light from the object and the spectrum of the light source, the first of which is constant and the second variable. The question of whether colour constancy is a real phenomenon or whether it is simply a measure of our ability to substitute the actual colour of objects with a predicted colour for that object derived from memory has recently been put to the test in a series of experiments using new techniques. Colour constancy is normally evaluated by viewing Mondrian stimuli—collages of different coloured paper rectangles viewed under different spectral illuminations. However, they do not truly approximate to real surfaces which contain many other features including curves, textural properties, and shades, particularly when viewed as computer images. Such features may be important in providing clues as to the true colour of the light source based on reflections from highlights on the surface or "mutual reflections" from surface features which reflect onto each other. Recent studies use real images from which are subtracted individual features without the observer being aware that the feature derived from a change in the surface light properties or its reflectance, and the results have shown that colour constancy is not perfect; best results achieved being in the region of 80%. However, despite a few reservations concerning the experimental detail the results suggest that colour constancy is a real phenomenon. Both local and global contrast appear to be the main contributors to colour constancy with local contrast function at a precortical level while global contrast requires cortical processing.

British Ophthalmic Surveillance Unit (BOSU)

The most recent bulletin from BOSU, sponsored by the Iris Fund for the Prevention of Blindness, has reported on its several ongoing and completed studies including the epidemiology of sympathetic ophthalmia and acanthamoeba keratitis, and the outcome of visual loss in the better eye of patients with unilateral amblyopia. Other studies include a cohort study of stage 3 retinopathy of prematurity and a new study of the epidemiology of ocular toxocariasis. The scheme involves 982 ophthalmologists in Britain and Ireland and, according to the organisers, the response rates continue to climb, with up to 80% response rate from ophthalmologists in Scotland. Remarkably, overall, 71% of participants have maintained a 100% record since the start of the scheme. Calculations also indicate that over 50% of participants have contributed at least one case to one of the above studies. New studies which will commence in the near future include an observational study of solar eclipse burns, a prospective study of the incidence and causes of severe visual impairment and blindness in childhood, a treatment study of post-cataract endophthalmitis, and an epidemiological study of ocular adnexal lymphoma.

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Childhood myopia and night-time lighting

A recent letter to *Nature* suggested that there is a link between night-time light exposure and the development of myopia in childhood (1999;399:113-4). A study of children aged 2-16 years who slept with different levels of night lighting indicated that those sleeping in total darkness were much less likely to develop myopia than those who slept with the room lighting or even with a night light. The effect was dose dependent and related only to myopia not to hyperopia. The researchers suggest that the risk of developing myopia relates to the transmission of small amounts of light through the thin eyelid skin of the child and may also be associated with attempts to sharpen a degraded image. It also raises the possibility of a critical period for refractive development analogous to that for visual dysfunction. The authors recommend that infants and children should sleep without artificial lighting until these findings can be confirmed or otherwise.

AE-941: a new antiangiogenic agent from shark cartilage

Cartilage has long been known to possess properties which inhibit the development of new blood vessels. A company, Aeterna Laboratories Inc (Quebec City), has recently presented information which shows that its lead product AE-941 (Provascar), which is derived from cartilage, inhibits binding of VEGF to receptors on human and bovine endothelial cells but also inhibits the action of matrix metalloproteinases MMP-2, MMP-9, and MMP-12. In this way it has a dual action on new blood vessels and has been shown through this action to inhibit tumour growth in phase 1/2 clinical trials. Phase 2 trial are now planned. Further applications are clear and include many of the vascular retinopathies in which new blood vessel formation is a key component.



Br J Ophthalmol 1999 83: 1105
doi: 10.1136/bjo.83.10.1105

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