FLUORESCENCE OPHTHALMOSCOPY*†

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FLUORESCENCE ophthalmoscopy is an important manoeuvre that can provide a great deal of information about certain pathological lesions of the retina and choroid, but simple observation of the fundus appearances after intravenous fluorescein injection has tended to be neglected in favour of photographic recordings. The apparatus required for the latter is expensive and time-consuming, and often requires a special technician or trained worker. It is also, at the present stage of its development, unsuitable for small children.

Apparatus

Observation of the fluorescence effects can be carried out fairly easily on the slit lamp using a fundus contact lens and the cobalt blue light, but an even simpler technique has been developed using a Keeler Pantoscope, in which the polarizing filters have been replaced with Ilford filter 622, bright spectrum blue, in the pathway of the light source, and Ilford 110 Micro 4 minus blue, very deep yellow, in the viewing pathway (Figure). The filters can be inserted by any competent technician or by the Keeler optical company.‡

The blue filter transmits light of 4750 Å maximally which excites the fluorescein in the retinal vessels and choroid to emit light of 5200 Å. The contrast between the fluorescence and the background is greatly enhanced if a barrier filter is inserted in front of the observer's eye so that only light of 5200 Å is transmitted. There is a certain amount of transmission of other wavelengths, but it is reduced as much as possible by this selection of filters which was first recommended by Edwards (1967, personal communication). The use of interference filters as recommended for photography by Haining and Lancaster (1968) does not seem to be necessary for this method of observation.

Procedure

5 ml. 10 per cent. aqueous solution of fluorescein are drawn up in a 10 ml. syringe and a venepuncture is performed with a No. 12 needle. The observation is best carried out in the dark, except for a small light for the assistant when giving the injection, and the pupils must be dilated. The fundus is scrutinized with the Pantoscope and the area to be observed located; then the blue filter is switched in to allow the observer's eye to become adapted to the reduced illumination; then the yellow filter is switched in without moving the ophthalmoscope and the injection is given by the assistant.

Comment

Any abnormalities in the filling of the retinal vessels or in the choroidal pattern are easily detected. The method has been particularly useful in recognizing leaks from the choroid in central serous retinopathy and in differentiating papilloedema from pseudopapilloedema. Experiments have been made with several types of ophthalmoscopes and with different

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fluorescence ophthalmoscopy

The binocular indirect ophthalmoscopes, both Schepens and Fison models, gave insufficient illumination for adequate visibility and the results were always inconclusive. Similarly, the direct ophthalmoscopes with low-voltage bulbs were not sufficiently powerful to produce adequate fluorescence. The models tested were the Hamblin Lister Morton battery type, the Keeler “Practitioner” model, and the Oculus “Visuscope”. Kodak Wratten filters 47B and 58, as recommended by the original workers Novotny and Alvis (1961), were found to transmit too little light even with the Pantoscope, and Schott filters BG12 0.7 mm. and GG14 3 mm., which were suggested by Oosterhuis and Lammens (1965), did not give such good results as the Ilford filters described above.

Fluorescence fundus examination is a very useful technique offering a most valuable aid to diagnosis which can be carried out without expensive photographic apparatus. The Keeler “Pantoscope” ophthalmoscope can be adapted at a small cost and has proved simple to operate.

I am grateful to Mr. John Edwards who first suggested the use of the Ilford filters in the study of transmission curves.

REFERENCES