However, solar retinopathy takes on a much more sinister aspect with the presentation of the fifth case. Here a healthy young woman was sunbathing, and it seems probable that as a consequence of this innocent act she sustained a severe macular burn, leaving her with a permanent central field defect in one eye, an anatomical lesion, and possibly the predisposition to macular degeneration in this eye in later life (Corcelle, 1958).

The warnings made by Knudtzon (1948) need repeating, especially as they bear on the false sense of protection afforded by dark glasses, red glass filters, smoked glass, and overexposed negative films. The only safe way of observing the sun, the method used by astronomers, is to project the sun's image on to a screen. For the amateur a pin-hole and sheet of matt paper held in the shade behind it will suffice (Gilkes *et al.*, 1961).

In the case of accidental solar retinopathy it is difficult to suggest any protective measure other than greater public awareness of the dangers involved. Publicity before the eclipse of 20 May 1966 was responsible for much sun-gazing, and no safe protective methods were advocated. In effect, interest was aroused and the dangers were minimized.

Summary

Four cases of eclipse burn and one of solar retinopathy due to sunbathing are presented. The seriousness of an apparently

trivial action in terms of visual function is demonstrated and attention is drawn to the possibility of accidental macular burns.

More effective methods of prevention are advocated and it is urged that public awareness of the dangers be aroused.

I wish to record my thanks to Messrs. J. P. F. Lloyd, V. Purvis, and A. C. L. Houlton for permission to report cases under their care, to Mr. T. Ramsell for much critical assistance, and to Mr. E. W. Allen and his staff for the photography.

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Effect of Oral Contraceptives on Erythrocyte Sedimentation Rate in Healthy Young Women

J. LI. BURTON,* M.B., CH.B., B.SC., M.R.C.P.

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The erythrocyte sedimentation rate (E.S.R.) is a useful non-specific test for a variety of diseases accompanied by inflammation or breakdown of tissue. It is often used as a screening test for occult disease in the absence of physical signs, and it is also useful for assessing progress in chronic or relapsing disease.

A recent reply in the "Any Questions?" column of the *British Medical Journal* (25 March 1967) has implied that the E.S.R. in women taking oral contraceptives is normal. It has long been known that the E.S.R. is raised above the usually accepted limits of normal in pregnancy (Fåhræus, 1918; Bochner and Wassing, 1925; Dawson, 1960), and since the physiological effects of oral contraceptives are in many ways similar to those of pregnancy it was decided to investigate their effect on the E.S.R. in normal young women.

Methods

Women attending a routine family planning clinic were divided into two groups according to whether they used oral contraceptives¹ or an occlusive pessary. After a medical interview a 2.5-ml. sample of venous blood was obtained for the estimation of haemoglobin, packed cell volume, and E.S.R.

* Assistant Lecturer, Department of Medicine, the Royal Infirmary, Edinburgh 3.

¹ The oral contraceptives used in this study were: Ovulen (mestranol 0.1 mg. and ethynodiol diacetate 1 mg.), Lyndiol (mestranol 0.15 mg. and lynoestrenol 5 mg.), Lyndiol 2.5 (mestranol 0.075 mg. and lynoestrenol 2.5 mg.), and Gynovlar (ethinyloestradiol 0.05 mg. and norethisterone acetate 3 mg.).

All women included in the final study conformed to the following criteria: (1) they were below 40 years of age; (2) they had been using the same contraceptive method for at least six months previously; (3) they gave no history of previous serious or chronic illness, and had not suffered from overt infection during the previous four weeks; (4) they felt perfectly well on the day of attendance at the clinic; and (5) they had haemoglobin levels and packed cell volumes within normal limits (Hb 11.5–16.4 g./100 ml.; P.C.V. 36–47%).

The relation of the timing of the blood sample to the menstrual period was not determined, since this was a random variant in both groups, and in any case the fluctuation of E.S.R. with menstruation is insignificant (Greisheimer, 1927; Wintrobe, 1961).

Seventy-eight women were included in the study, of whom 42 had been taking oral contraceptives and 36 had been using an occlusive pessary.

The blood samples were transported in polystyrene bottles containing Sequestrene anticoagulant, and the E.S.R. was determined within six hours by the Westergren method, a one-fourth part of 3.8% sodium citrate solution (Dacie and Lewis, 1963) being used. Various authors have given results varying from 7 to 25 mm. in the first hour for the upper limit of the normal E.S.R. in women (Westergren, 1926; Dawson, 1960; Dacie and Lewis, 1963; Hilder and Gunz, 1964; Böttiger and Svedberg, 1967). The normal value used in this laboratory for young women is up to 7 mm. in the first hour (Dacie and Lewis, 1963), and this is also the value proposed by the British Standards Institution Technical Committee on Haematological Equipment and Methods (Lewis, 1965).

Results

The results are presented in the Table. Of the 42 women taking oral contraceptives 19 (45%) had an E.S.R. above our upper limit of normal, the highest value recorded being 17 mm. in the first hour. None of the patients in the control group had an E.S.R. exceeding 7 mm. The mean value for the E.S.R. in the group taking oral contraceptives was 7.2 mm. in the first hour, compared with 4.0 in the control group, and this difference was statistically significant ($P < 0.02$).

Westergren E.S.R. (mm. in First Hour)

Women in Control Group			Women Taking Oral Contraceptives			Student's <i>t</i> Test
Mean	Range	S.D.	Mean	Range	S.D.	
4.0	1-7	1.9	7.2	2-17	4.4	0.02 > P > 0.01

Discussion

The E.S.R. depends on the rate of erythrocyte rouleaux formation, which in turn depends on the plasma concentration of asymmetric macromolecules such as fibrinogen, and to a less extent on α_2 - and γ -globulins (Hardwicke and Squire, 1952). Rouleaux formation is probably mediated by a specific plasma protein called "agglomerin," which requires the presence of a supplement of high molecular weight such as fibrinogen for its action (Ruhenstroth-Bauer, 1961). The E.S.R. thus supplies a simple screening test for the presence of raised concentrations of large molecules such as fibrinogen and the larger globulins.

The rise in E.S.R. which accompanies normal pregnancy is attributable to the increased concentration of fibrinogen, which is well documented (Gillman *et al.*, 1959; Ratnoff and Holland, 1959; Pechet and Alexander, 1961). Similar increases in fibrinogen concentration have been reported in women taking oral contraceptives (Rapaport, 1962; Donayre and Pincus, 1965; Miller *et al.*, 1965), and this probably accounts for the increased E.S.R. demonstrated in the present study. The effect of hormonal influences on the E.S.R. merits further investigation, however, since Böttiger and Svedberg (1967) have shown that the normal increase in E.S.R. with advancing age is accelerated after the menopause.

These results are reported in order to draw attention to the fact that the E.S.R. may be raised above normal in women

taking oral contraceptives and that the isolated finding of a moderately raised E.S.R. is not necessarily an indication for further investigation. Similarly, the assessment of chronic disease by changes in E.S.R. may need to be modified if it is known that the patient is taking oral contraceptives.

Summary

The Westergren erythrocyte sedimentation rate (E.S.R.) was determined in 42 healthy young women taking oral contraceptives. The mean E.S.R. was significantly higher than in a control group of the same age, and 45% of the women taking oral contraceptives had an E.S.R. above the upper normal limit for their age.

The finding of a slightly raised E.S.R. in an otherwise healthy young woman taking oral contraceptives is not an indication for further investigation.

ADDENDUM.—Since the above report was submitted for publication E.S.R.s in the range 17–36 mm./hr. have been discovered in a further five women taking oral contraceptives who conformed to the above criteria.

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Treatment of Radiation Sickness with Pyridoxine Hydrochloride in Outpatients of a Radiotherapy Unit

H. MATTIE,* M.B.; E. W. EMERY,† F.F.R.; I. D. HILL,‡ B.Sc.; D. R. LAURENCE,§ M.D., F.R.C.P.

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Since Maxfield *et al.* (1943) reported "most satisfying" results with intravenous pyridoxine hydrochloride in patients with radiation sickness the vitamin has become widely used in this condition, more often administered orally than parenterally (Reeves, 1946; Oppenheim and Lih, 1946; Wells and Popp, 1947; Shorvon, 1949; Strahm, 1955; Silverman *et al.*, 1956; Stoll, 1957; Finney, 1961).

However, so far as we know, of the many reports on this treatment only a few are based on properly controlled studies:

* Department of Pharmacology, University of Leiden.

† Department of Radiotherapy, University College Hospital, London W.C.1.

‡ Medical Research Council, Statistical Research Unit, London W.C.1.

§ Medical Unit, University College Hospital Medical School, London W.C.1.

one study with rather low dosages (Silverman *et al.*, 1956), and another with breast cancer patients only (Finney, 1961). These authors found no difference between pyridoxine and a placebo.

The study reported here was devised in an attempt to reassess the value of pyridoxine.

Design of the Trial

Since radiation sickness manifests itself as a complex of subjective, often vague, complaints, mixed with symptoms due to the original disease or to anxiety, it is obvious that a study of the effect of treatment should be conducted double-blind, and this was done.