The actions and effects of vaginally administered prostaglandins would be expected to be similar to those of intravenous therapy, as the effect is considered to be via systemic absorption from the vagina. At present the plasma levels of prostaglandin $F_{2\alpha}$ obtained after vaginal administration are uncertain. The pattern of coagulation changes found in the present study showed no obvious difference between the intravenous and vaginal route.

The present study suggests that when second-trimester abortion is induced by prostaglandins the effect on the coagulation system is considerably less than that which accompanies induction of second-trimester abortion with hypertonic saline or occurs with abdominal delivery in late pregnancy (Bonnar *et al.*, 1970).

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Electroencephalographic Changes in Epileptics while Viewing Television

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Summary

Ten consecutive epileptic patients who showed abnormal electroencephalographic (E.E.G.) responses to intermittent photic stimulation have been studied while watching television. Though only two gave a history of television epilepsy nine exhibited spike-wave discharges in the E.E.G. during viewing. This effect occurred when the set was functioning normally but was increased in five subjects when the screen was deliberately caused to flicker.

Introduction

It is well established that watching television may precipitate seizures ("television epilepsy") both in some patients with known epilepsy and in others who do not apparently suffer fits except when viewing (Karlson, 1959; Klapatek, 1959; Lange, 1961; Charlton and Hoefer, 1964). Photic stimulation by a stroboscope also produces seizures in a significant proportion of people with epilepsy and elicits paroxysmal electroencephalographic (E.E.G.) discharges in many more (Gastaut *et al.*, 1958). Abnormal photic responses can usually be demonstrated in patients with television epilepsy (Gastaut and Tassinari, 1966; Jeavons and Harding, 1970) but there have been few E.E.G.

studies of epileptics viewing television. Gastaut *et al.* (1962) investigated 35 people thought to have television epilepsy and recorded their E.E.G.s during viewing, but in none was any significant response observed. Other authors have elicited paroxysmal activity by using television as a stimulus, but only by putting the controls grossly out of adjustment to produce slow flicker or by changing channels (Ritcher, 1960; Dumermuth, 1961; Andermann, 1971). We report a similar study with very different results.

Material and Methods

The study is based on 10 consecutive patients who exhibited photoconvulsive responses (as defined by Bickford *et al.*, 1952) to stroboscopic stimulation during routine E.E.G. investigation in a recording suite where a television set was installed. Their ages ranged from 7 to 29 years (mean 15.7 years); two gave a history of television epilepsy and one reported strange sensations when using a stroboscope to tune a motor car engine. Nine patients showed spontaneous paroxysmal activity in the resting record. The photic stimulator used (Specialised Laboratory Equipment, Type C.P.S.1) had a fine grid placed over the cover glass as recommended by Jeavons *et al.* (1972) and was placed at a distance of 25 cm from the nasion. When photosensitivity was detected bursts of flashes were delivered at various frequencies to determine the range of flicker rates over which abnormal responses could be elicited with the eyes open or closed.

The patient was then asked to view, under conditions of normal room lighting, a 24 in. (61 cm) 405-line black and white television set from a distance of roughly 0.5 m. If paroxysmal activity occurred or showed an appreciable increase above the resting level the patient was then progressively moved away from the set until this effect ceased. When no E.E.G. response was apparent the set was deliberately put out of adjustment.

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The brightness was increased first, followed by contrast; these were then returned to their normal settings and the vertical and horizontal holds were altered independently to produce flickering and jerking of the picture.

Results

One patient showed only a minimal photoconvulsive response which occurred inconstantly and did not outlast the train of stimuli by more than 0.5 sec. He showed no response to television. All of the remaining nine with clear photoconvulsive responses showed generalized spike-wave activity while watching television (chart). If these discharges were present in the resting record their incidence (assessed in bursts per minute or per cent. time as appropriate) increased at least five-fold during viewing). In two patients some of the paroxysmal activity was

E.E.G. recorded from a 12-year-old boy showing photoconvulsive response from stroboscopic stimulation at 10 Hz (left hand excerpt) and the generalized polyspike and wave discharges while viewing television at a distance of 10 ft (3 m.) (right hand excerpt).

accompanied by jerking. The range of maximum distances from the set at which discharges occurred was from 0.5 m to 4 m (mean 1.3 m). Increasing the contrast and brightness seemed to have little influence, but interfering with the vertical and horizontal holds to cause gross flickering produced a response in five patients from distances at which the normally functioning set had no apparent effect.

One patient returned after her anticonvulsant treatment had been increased. She was no longer sensitive to photic stimulation but again produced paroxysmal activity while watching television (on this occasion a different set—a 12 in (30.5 cm) 405-line black and white portable model).

Comment

The finding of abnormal responses to viewing television in all of those subjects with any pronounced photoconvulsive response is perhaps less surprising than the failure of other workers to find such an effect even in patients with known television epilepsy, except by producing gross malfunction of the set. A 405-line television intended for a 50 Hz mains supply presents 10,125 lines and 25 frames (or strictly 50 interlaced half frames) per second. These frequencies are above the optimum for producing photoconvulsive responses in most susceptible subjects: five of the nine patients responding to television were photosensitive to stroboscopic illumination at 25 Hz and only one at 50 Hz. Several authors, on the basis of the patients' histories, have suggested that an obviously flickering television is necessary to produce seizures (Lange, 1961; Mawdsley, 1961; Charlton and Hoefer, 1964). The present findings indicate that this may not be so, but it may nevertheless be significant that the extensive study carried out by Gastaut *et al.* (1962) with negative results (even during induced flickering of the screen) was performed at the studios of the French national broadcasting corporation, R.T.F. Presumably the equipment used was of much higher quality than that available to the domestic user. Minor instabilities of a kind which do not seriously interfere with the quality of the picture—for instance, "hunting" in the automatic gain control circuit—may be responsible both for abnormal E.E.G. responses and for some episodes of television epilepsy. This possibility is now being investigated.

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