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Oral Contraceptives and Cerebrovascular Complications[1]

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IN 1957 ORAL contraceptives were introduced under limited production in the United States for investigational purposes. Within three years they had been approved by the Food and Drug Administration and were made available for widespread clinical use. It is now estimated that seven to eight million women are using the agents, more than five million of whom dwell in the United States. This volume of use may well exceed that of any other potent medication (12).

During the ten-year period of oral contraceptive use, numerous reports of adverse effects of the medication, including strokes, have been published. The American Commissioner of Food and Drugs (10) recently warned all physicians that studies have now confirmed a definite association between the use of oral contraceptives and thromboembolic disorders.

While many reports of clinical data have been published, relatively few cases having angiographic verification and localization of the cerebrovascular occlusion have been described. The purpose of this paper is to report the radiologic features associated with the neurologic disorders in patients on this medication who have been examined and treated at the Neurological Insitute of New York. Other purposes are to point out the increasing incidence of such cerebrovascular lesions in neuroradiologic practice, the need for all radiologists to be alert to the etiology of occlusions in younger women, and to emphasize the prodromal symptoms that could have warned of an incipient stroke in the group studied.

PRIOR INVESTIGATION

Thromboembolic phenomena in women receiving oral contraceptives have been annotated in the world literature with increasing frequency since 1961 (6, 13, 17, 18). The first report of central nervous system involvement was a case of venous thrombosis described in 1962 by Lorentz (14). In 1963, however, an *ad hoc* advisory committee of the Food and Drug Administration headed by Wright (25) found insufficient evidence to indict oral contraceptives as causing thromboembolic conditions although recognizing adverse reactions in the presence of epilepsy, asthma, cardiac and renal disease, diabetes, hypertension, and numerous other circumstances and associations such as endocrine disorders, the alteration in growth rate of certain tumors, and psychic depression.

TABLE I: ANGIOGRAPHIC FINDINGS IN WOMEN TWENTY TO FORTY-FOUR YEARS OF AGE

	No. of Cases	
	1960	1966
Nonocclusive disease	58	55
Occlusive disease, not hormone-related	1	1
Occlusive disease, hormone-related	1	8
TOTAL	60	64

Subsequently, reports of arterial thrombotic phenomena involving the central nervous system began to appear in rapid succession (1, 11, 15, 21, 26). In 1965, Walsh and his co-workers (23) at the Johns Hopkins Hospital described 69 cases of neuro-ophthalmologic interest which were associated with the ingestion of contraceptive agents; 25 of the patients had strokes. Since this time the importance of sudden partial loss of vision, diplopia, and papilledema as warning symptoms and signs of even more serious neural lesions have been appreciated.

The following year Shafey and Schein-

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