THE EFFECT OF ORAL CONTRACEPTIVE AGENTS (OCA) ON NUTRITION

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INTRODUCTION

Although recent reports have caused concern about the safety of oral contraceptive agents (OCA), statistics show that the mortality rate for "pill" users is 3 per 100,000. When this is compared with the mortality rate of 28 per 100,000 in pregnancy, and 25 per 100,000 in auto accidents, the risk seems small (1). There is increasing evidence that metabolic changes do occur, and present research is concerned with determining the severity and incidence of these changes (2). The metabolism of women receiving OCA is similar to that of pregnant women. Since the metabolic changes during pregnancy increase the requirements for some vitamins and minerals, the OCA user should have similar increased requirements. It is the purpose of this report to relate the findings of current research to the influence of oral contraceptive agents on nutrition.

HISTORY OF CONTRACEPTIVES

In 1937, Makepeace et al. (3) reported that ovulation in female rabbits could be inhibited as a result of treatment with the hormone, progesterone. In 1939, Sturgis and Albright (4) demonstrated that estrogen could inhibit ovulation in humans. For a number of years estrogen was used in the treatment of dysmenorrhea and menstrual irregularities. Evidence soon showed that estrogen couldn't be relied upon to regulate the cycle or to inhibit ovulation (5). The development of an effective oral contraceptive awaited the development of a progesterone-like synthetic hormone which was readily absorbed when given orally (6).

At a symposium on antifertility drugs in 1969, Drill (6) traced the history of oral contraceptives. Studies begun in 1952 by Colton and

Saunders at Searle Laboratories led to the development of the progestin of the first oral contraceptive. A second progestin was developed several years later by Djerrasi at Syntex Laboratories. These progestins and others developed since are used with estrogens and form the basis of the oral contraceptives that are currently in use.

A clinical trial of the first oral contraceptive, Enovid, in Puerto Rico was reported by Pincus in 1957 (7). Additional studies were carried out in Haiti and the United States. In 1957, Enovid was released for menstrual disorders; in 1960, it was approved as an oral contraceptive (8). The first oral contraceptive was a 10 mg. pill which contained progestin and a small amount of estrogen (8). Early pill users suffered side effects such as nausea, vomiting, large gains in weight and fluid retention, and thromboembolic disease. Since then new progestins have been introduced and the dosage has been reduced, thus eliminating many of the initial adverse side effects (8).

Because the cost is low, effectiveness is virtually 100%, and convenience is greater than other methods of birth control, the oral contraceptive has gained wide acceptance. At the present time it is estimated that more than 10 million women in the United States use this type of birth control (5).

FEMALE REPRODUCTIVE SYSTEM

Normal functions of the menstrual cycle. The menstrual cycle is a complex interplay between several hormones and between the endocrine and nervous systems (9). At the beginning of a new cycle (fig. 1), the uterine lining is thin and there are no ripe follicles in the ovaries. The first

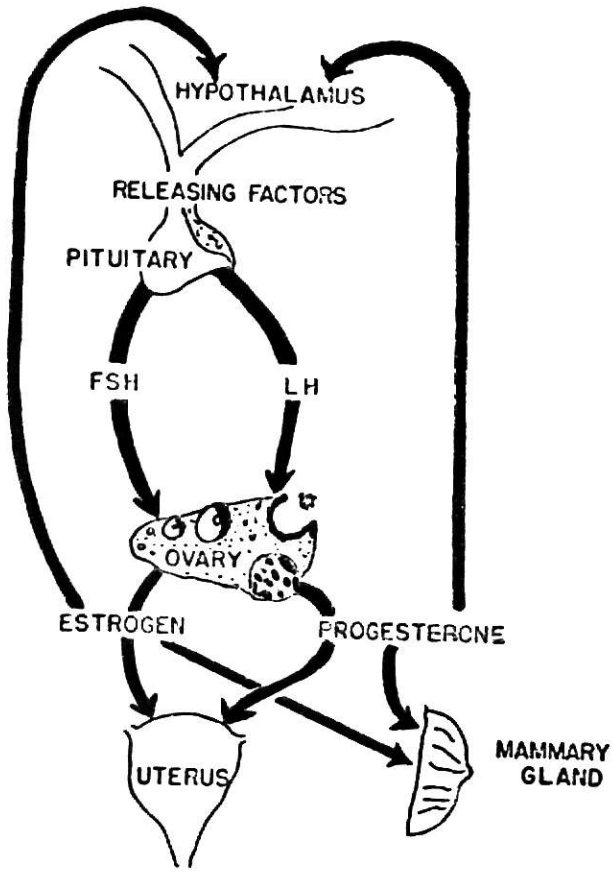

Fig. 1 Diagrammatic representation of interplay of sex hormones and gonadotropins in a normally cycling woman (8).

event in the new cycle is an increase in secretion of follicle-stimulating hormone (FSH) by the anterior pituitary. As a result of stimulation by the hypothalamus, FSH stimulates growth of follicles in the ovaries. The growing follicles begin secreting the first of the two female sex hormones, estrogen. The estrogen stimulates the lining of the uterus to thicken. This growth phase lasts, on the average, about nine to ten days.

As the follicles grow, they produce more estrogen. This increase in the level of estrogen in the blood exerts an inhibitory effect on the FSH-stimulating center in the hypothalamus. The result is a drop in secretion