

function tests return to normal several weeks after medication is discontinued. It is thought that this effect is due to the estrogen rather than the progestogen.

One of the better known metabolic effects is the ability of oral contraceptives to modify carbohydrate metabolism. This subject is reviewed in detail for the committee by Professor Wynn and Dr. Spelacy. Recent investigations show that a significant proportion of normal women on these agents appear to handle sugar in an abnormal way. Similar alterations are often seen in pregnancy to a larger degree and the changes vary considerably according to the specific oral contraceptive used.

Oral contraceptives also appear to increase the amount of insulin which is produced as well as other agents related to the metabolism of sugar. Such effects are more pronounced with the combined rather than with the sequential regimes and less with formulations which contain no estrogen. Whereas glucose tolerance tests return to normal shortly after medication is stopped, insulin levels may remain elevated for some time.

Approximately 25 to 40 percent of women on oral contraceptives have some changes in tests of thyroid function. Not all thyroid tests are changed however. The basal metabolic rate, for instance, does not appear to be altered and there is good evidence that the true function of the thyroid is not changed.

Some tests for adrenal gland function are also changed. The levels of certain agents such as cortisol are increased and the excretion of certain normally occurring steroids is increased. There is also no evidence that these changes have an effect on health.

The effects of oral contraceptives on blood vessels are related to their known relationship with thromboembolism. It is known, for instance, that steroids alter the diameter of veins and other blood vessels. These effects are also related to the changes in blood pressure observed in some users of oral contraceptives. Several reports of hypertension have appeared and there is an increasing body of evidence that there may be a positive relationship. If this is true, the effect is mediated through a variety of factors, including effects on blood vessels and on control systems which regulate blood pressure levels.

Another biologic change of increasing concern is the effect on the way the body handles fat. This effect is closely related to changes in sugar metabolism since fat synthesis is related to insulin levels. The changes which have been observed in fat metabolism simulate levels seen in older individuals and raise concern over the possibility that these alterations may be related to heart disease. We have no knowledge, however, of the true significance of these observations.

The task force's review identified a variety of other effects, such as changes in the way the body handles water, salt, and various minerals such as calcium, magnesium, copper, and zinc. We also noted changes in lung function, and a variety of reported effects on the central nervous system. Two well-known effects on the central nervous system are depression and headache, but such information is particularly difficult to evaluate since there is great variation in these conditions and objective evaluation is hard to achieve. We also noted reports of effects on the skin and on a wide range of other body functions. These reports are clinical accounts and as yet have no statistical validity.