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[Intervention Review]

Steroidal contraceptives: effect on carbohydrate metabolism in women without diabetes mellitus

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ABSTRACT

Background

Many hormonal contraceptives have been associated with changes in carbohydrate metabolism. Alterations may include decreased glucose tolerance and increased insulin resistance, which are risk factors for Type 2 diabetes mellitus and cardiovascular disease. These issues have been raised with progestin-only contraceptives as well as contraceptives containing estrogen. Such potential effects could influence recommendations for, and use of, these widely used and effective contraceptives.

Objectives

To evaluate the effect of hormonal contraceptives on carbohydrate metabolism in healthy women and those at risk for diabetes due to overweight.

Search methods

We searched the computerized databases MEDLINE, POPLINE, CENTRAL, EMBASE, and LILACS for studies of hormonal contraceptives and carbohydrate metabolism. We also searched for clinical trials in ClinicalTrials.gov and ICTRP. We wrote to investigators for information about other published or unpublished trials.

Selection criteria

All randomized controlled trials were considered if they examined carbohydrate metabolism in women without diabetes who used hormonal contraceptives for contraception. Interventions could include comparisons of a hormonal contraceptive with a placebo, a non-hormonal contraceptive, or another hormonal contraceptive that differed in drug, dosage, or regimen. Interventions included at least three cycles. Outcomes included glucose and insulin levels, which were generally reported as fasting value or response to an oral glucose tolerance test.

Data collection and analysis

We assessed for inclusion all titles and abstracts identified during the literature searches with no language limitations. The data were abstracted and entered into RevMan. Studies were examined for methodological quality. For continuous variables, the mean difference was computed with 95% confidence interval (CI) using a fixed-effect model. For dichotomous outcomes, the Peto odds ratio with 95% CI was calculated.



Main results

We found 43 trials that met the inclusion criteria. No study stratified by body weight (normal-weight versus overweight women). Results for desogestrel were often favorable regarding carbohydrate metabolism but inconsistent overall. Glucose and insulin means were more favorable for norethisterone in studies of progestin-only contraceptives. For other progestins, little or no difference was noted across trials.

Authors' conclusions

Current evidence suggests that hormonal contraceptives have limited effect on carbohydrate metabolism in women without diabetes. Strong statements cannot be made, though, due to having few studies that compared any particular types of contraceptives. Many trials had small numbers of participants and some had large losses. Many studies had poor reporting of methods. No information was available regarding the effects among women who were overweight.

PLAIN LANGUAGE SUMMARY

Hormone contraceptives and how the body uses carbohydrates in women without diabetes

Hormone contraceptives may change how the body handles carbohydrates (starches and sugars). Changes may include lower ability to use sugar from food and more problems with the body's insulin. Insulin is a hormone that helps the body use sugar. Problems with blood sugar can increase risk for diabetes and heart disease. Due to concern about health risks, health care providers may not suggest hormone contraceptives and women may not want to use them.

We did a computer search for studies of birth control methods containing hormones and how carbohydrates are handled in the body. Outcomes were glucose or insulin levels in the blood. Birth control methods included types with estrogen and progestin or just progestin. The type of birth control could be pills, shots (injections), implants (matchstick-size rods put under the skin), the vaginal ring, or an intrauterine device (IUD). We wrote to researchers to find other trials. We included randomized trials in any language that had at least three treatment cycles. The studies had to compare two types of birth control or one type of birth control with a placebo or 'dummy' method.

We found 43 trials; 27 had enough data to analyze. No study looked at how carbohydrates were handled in women who were overweight. Glucose values were often better for combined pills that had desogestrel than with other pills but the insulin results were not consistent. In trials of birth control with only progestin, glucose and insulin levels were better for norethisterone than other progestins studied.

Current data show that hormone contraceptives have little effect on carbohydrate use by the body in women without diabetes. Strong statements cannot be made due to few studies that compared the same types of birth control. Many trials had small numbers of women and many of the women dropped out. More careful studies and better reporting would help in making suggestions for practice.