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Review article

Laboratory screening prior to initiating contraception: a systematic review☆

Naomi K. Tepper*, Maria W. Steenland, Polly A. Marchbanks, Kathryn M. Curtis

Division of Reproductive Health, Centers for Disease Control and Prevention, Atlanta, GA 30341, USA

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Abstract

Background: Certain contraceptive methods may increase the risk of adverse events for women with certain medical conditions, including some women with diabetes, hyperlipidemia, liver disease, cervical cancer, sexually transmitted infections (STIs) or human immunodeficiency virus (HIV). This review was conducted to evaluate the evidence regarding health outcomes among women with and without laboratory testing to identify certain medical conditions prior to initiating contraceptives.

Study Design: The PubMed database was searched from database inception through April 2012 for all peer-reviewed articles in any language evaluating health outcomes among women who initiated certain contraceptive methods and who had or had not received glucose, lipid, liver enzyme, cervical cytology, STI or HIV screening.

Results: The systematic review did not identify any relevant direct evidence.

Conclusions: While certain methods of hormonal contraception may not be safe for use by some women with diabetes, hyperlipidemia or liver disease, there is little value in screening for these conditions in asymptomatic women prior to initiation of contraceptive methods due to the low prevalence of these conditions among women of reproductive age. Although intrauterine devices (IUDs) and cervical caps should not be initiated in women with cervical cancer, the high rates of cervical screening and low incidence of cervical cancer in the United States make this scenario unlikely. Although some women at risk for, or infected with, STIs or HIV should not undergo IUD insertion, if women have been screened for STIs or HIV according to guidelines, additional screening at the time of IUD insertion is not warranted. Requiring unnecessary laboratory screening prior to initiation of contraceptive methods may impose barriers to contraceptive access, and efforts to remove such barriers are critical in reducing unintended pregnancy.

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Keywords: Glucose; Lipids; Liver enzymes; Cervical cytology; Sexually transmitted infections; HIV; Contraception

1. Introduction

Approximately 50% of pregnancies in the United States are unintended, and those pregnancies are at increased risk for adverse maternal and infant outcomes [1,2]. Over 4 million women at risk for unintended pregnancy in the United States are not using contraception [3]. Efforts to increase contraceptive access and use are critically important in reducing unintended pregnancy. According to the US Medical Eligibility Criteria for Contraceptive Use, 2010 (US MEC), some women with medical conditions, including diabetes, hyperlipidemia, liver disease, cervical cancer, sexually transmitted infections (STIs) and human immunodeficiency virus (HIV), should not use certain contraceptive methods due to safety concerns [4]. However, there is uncertain value in screening for these medical conditions prior to initiating contraception, and requiring unnecessary screening may impose barriers to contraceptive access. Systematic reviews were conducted to evaluate the evidence regarding outcomes among women with and without laboratory screening prior to initiating contraceptives. Laboratory tests considered included glucose, lipids, liver enzymes, cervical cytology, STI screening and HIV screening.

2. Methods

We searched the PubMed database for all peer-reviewed articles in any language published from database inception

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* Corresponding author. Tel.: +1 770 488 6506; fax: +1 770 488 6391.
E-mail address: ntepper@cdc.gov (N.K. Tepper).

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through April 2012. The search strategies are shown in Appendix A. References from articles were hand-searched to identify any additional relevant articles. Because some women with diabetes, hyperlipidemia, or liver disease should not use (US MEC 4) or generally should not use (US MEC 3) hormonal contraceptives [4], we sought direct evidence of outcomes among women screened versus not screened for these conditions prior to initiation of hormonal contraceptives. Because women with cervical cancer should not initiate use of intrauterine devices (IUDs) or cervical caps (US MEC 4), we sought evidence which addressed IUD insertion or cervical cap initiation among women screened versus not screened with cervical cytology and reported outcomes such as perforation, bleeding or effects on cancer course. Because some women with STIs or HIV should not initiate use of (US MEC 4) or generally should not initiate use of (US MEC 3) IUDs [4], we sought evidence for outcomes among women screened versus not screened for STIs or HIV prior to IUD insertion.

3. Results

For glucose screening and hormonal contraceptives, the search identified 418 articles. For lipid screening and hormonal contraceptives, the search identified 292 articles. For liver enzyme screening and hormonal contraceptives, the search identified 693 articles. For cervical cytology screening, the search identified 672 articles pertaining to IUD use and 67 articles pertaining to cervical cap use. For STI or HIV screening and IUDs, there were 942 articles identified by the search. After reviewing the titles and abstracts of these articles, as well as the full articles when necessary, no articles were identified with direct evidence pertaining to these searches. In addition, reference lists from review articles were hand-searched and did not identify any direct evidence.

4. Discussion

4.1. Glucose

There is concern that hormonal contraceptives can cause adverse effects on glucose tolerance and insulin sensitivity. Progestin-only implant and injectable contraceptives have been associated in some studies with increased insulin and glucose levels and incidence of type 2 diabetes [5]. Some small studies have shown that use of depot medroxyprogesterone acetate (DMPA) among women with diabetes may cause decreased insulin and increased glucose levels [5,6]. Older high-dose combined oral contraceptives were associated with abnormalities in glucose metabolism; however, more recently, lower-dose oral contraceptives have not been found to have effects on glucose and insulin levels [7]. Among diabetic women, combined oral contraceptives have been associated with increased fasting glucose levels, but not with increased risk for abnormal glycosylated hemoglobin values, retinopathy or nephropathy [6,8]. Overall, effects of hormonal contraceptives on glucose metabolism are likely to be minimal and not clinically significant [9].

In addition, the prevalence of diabetes among women of reproductive age is low. From 1999 to 2008 among women ages 20–44 years, the percentage with diagnosed diabetes was 3%, and the percentage with undiagnosed diabetes (i.e., the condition was diagnosed at the time of the study, but the woman had not been previously informed of having the condition) was 0.5% [10]. Although women with complicated diabetes (nephropathy, retinopathy, neuropathy, other vascular disease or diabetes of >20 years' duration) should not use (US MEC 4) or generally should not use (US MEC 3) combined hormonal methods or DMPA [4], it is unlikely that women with such complicated diabetes would remain undiagnosed.

4.2. Lipids

There is some evidence that use of hormonal contraceptives can cause adverse changes in lipid levels [11]. Women using combined oral contraceptives can experience increases in triglycerides (TG), total cholesterol and very low density lipoprotein cholesterol. While the estrogen-induced increase in TG does not appear to increase the risk for atherosclerosis, very high levels of TG can cause pancreatitis, and there is some theoretical concern about the use of combined hormonal methods among women with elevated TG [12]. Women using DMPA can experience decreases in high-density lipoprotein cholesterol level, which returns to baseline after the first 6 months of use [11]. However, studies have shown mixed results about the effects of hormonal methods on lipid levels, and in addition, the clinical significance of these changes is unclear [11,13]. Women with abnormal lipid levels at baseline were not found to have increased risk for adverse changes to their lipid profile when using hormonal methods [11].

From 1999 to 2008 among women ages 20–44 years in the United States, approximately 10% had hypercholesterolemia, defined as total cholesterol ≥240 mg/dL or currently taking lipid-lowering medications [10]. The prevalence of undiagnosed hypercholesterolemia among women ages 20–44 years during this same time period was approximately 2% [10]. Although some women with known hyperlipidemias generally should not use combined hormonal contraceptives (US MEC 3), the US MEC states that routine screening prior to hormonal contraceptive initiation is not appropriate because of the rarity of the conditions and high cost of screening [4].

4.3. Liver enzymes

Because estrogens and progestins are metabolized in the liver, there are concerns that hormonal contraceptives could worsen the clinical course of liver disease. Limited evidence has not shown any worsened outcomes among women with hepatitis or cirrhosis who use hormonal contraceptives [14]. Among women with benign focal nodular hyperplasia, hormonal contraceptive use does not affect either progression or regression of disease [15].