

Review article

Combined oral contraceptive use among women with hypertension: a systematic review

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Received 27 July 2005; accepted 11 August 2005

Abstract

Women with hypertension are at increased risk for cardiovascular events. Combined oral contraceptive (COC) use, even among low-dose users, has been associated with a small excess risk for cardiovascular events among healthy women. In this systematic review, we examined cardiovascular risks among COC users with hypertension. After searching MEDLINE for all articles published from 1966 through February 2005 relevant to COC use, hypertension and cardiovascular disease, we identified 25 articles for this review. Overall, these studies showed that hypertensive COC users were at higher risk for stroke and acute myocardial infarction (AMI) than hypertensive non-COC users, but that they were not at higher risk for venous thromboembolism (VTE). Women who did not have their blood pressure measured before initiating COC use were at higher risk for ischemic stroke and AMI, but not for hemorrhagic stroke or VTE, than COC users who did not have their blood pressure measured.

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Keywords: Combined oral contraceptives; Hypertension; Stroke; Myocardial infarction; Venous thromboembolism; Systematic review

1. Introduction

Hypertension is a primary risk factor for stroke and other cardiovascular events. While rates of cardiovascular events among healthy women of reproductive age are very low, hypertension increases that risk substantially. It is estimated that approximately 1.7 cases of myocardial infarction and 34.1 strokes occur each year per 1 million normotensive women aged 30–34 years, and that the rates of these events among hypertensive women of the same age rise to 10.2 for myocardial infarction and 185.3 for stroke [1]. Combined oral contraceptive (COC) use, even among low-dose users, has been associated with a small excess risk for cardiovascular events among healthy women. To help determine the effects of COC use on risk for cardiovascular events among women with hypertension, we conducted a systematic review of studies that have examined cardiovascular risks among women with hypertension who use COCs, specifically the effects of COC use on blood pressure and development

of peripheral arterial disease (PAD), acute myocardial infarctions (AMI), ischemic and hemorrhagic stroke, and venous thromboembolism (VTE).

We conducted this systematic review in preparation for an Expert Working Group of international family planning experts convened by the World Health Organization (WHO) in October 2003 to develop and revise medical eligibility criteria for contraceptive use. In this report, we provide the evidence obtained through our systematic review regarding COC use among women with hypertension, as well as the WHO recommendations that were derived in part from this evidence. This review also includes evidence identified since the 2003 meeting through February 2005.

2. Materials and methods

We searched MEDLINE for all relevant articles published from 1966 through February 2005 using the following search strategy: [(exp Contraceptives, Oral/ or oral contracept:) and (hypertension or blood pressure)] and (stroke. or exp Cerebrovascular Accident/ or exp Myocardial Infarction/ or pulmonary embolism/ or exp thromboembolism/ or exp venous thrombosis/ or thromboembolism or exp Peripheral

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Table 1
Studies of oral contraceptive use, hypertension and cardiovascular events

Author, year	Study setting	No. of cases/controls (control type)	Results	Adjustments	Weaknesses	Quality
<i>Hypertensive disorders</i>						
Narkiewicz et al., 1995 [4]	Europe	Cross-sectional study 94 women with mild hypertension	Daytime and nighttime systolic blood pressure was significantly higher in COC users (mean difference of 8.3 and 6.1 mm Hg, respectively); differences in diastolic pressure were not significant	Age, body mass index, duration of COC use, smoking	Cross-sectional design	Very low
Lubianca et al., 2003 [5]	Brazil, 1989–1997	Cross-sectional study 171 hypertensive women using COCs, other method users, non-method users	COC users had significantly higher diastolic blood pressure than the other two groups (100.3 vs. 93.0 and 93.5 mm Hg, respectively), had higher % of women with uncontrolled hypertension (83.3% vs. 65.4% and 68.4%, respectively), and had a higher % classified at stage 2 and 3 hypertension (21.2% vs. 19.2% and 12.7%, respectively)	Age, body mass index, use of antihypertensive drugs	Cross-sectional design	Very low
Van Den Bosch et al. 2003 [6]	Netherlands, RATIO Study, 1990–1995	152/925 (P)	ORs for PAD No HTN/no OC 1.0 (referent) No HTN/OC use 4.7 (2.8–7.8) HTN/no OC use 4.9 (2.5–9.5) HTN/OC use 8.8 (3.9–19.8)	Age, residence, calendar year	Selection bias — OC users more likely to be diagnosed with PAD	Low
<i>Myocardial infarction</i>						
Croft and Hannaford, 1989 [7]	United Kingdom, Royal College of General Practitioners Study, nested case-control 1968–1987	158/158 (population controls)	No HTN/no OC 1.0 (referent) No HTN/OC use 2.0 (1.1–3.9) HTN/no OC use 5.4 (2.6–11.2) HTN/OC use 7.7 (1.2–49.2)	Age	Unclear if authors adjusted for other potential confounders No specified diagnostic criteria	Intermediate
D'Avanzo et al., 1994 [8]	Italy, 1983–1992	251/475 (hospital controls)	OR 28.4 (6.7–120.1) for OC use/hypertension compared to never use/normotensive	Not stated	Unclear if authors adjusted for potential confounders Validation of cases not described	Low
WHO, 1997 [9]	Developing countries, 1989–1995	170/461 (hospital controls)	No HTN/no OC 1.0 (referent) No HTN/OC use 3.66 (1.81–7.39) HTN/no OC use 9.52 (4.90–18.5) HTN/OC use 15.3 (3.27–71.6) Blood pressure check 3.48 (1.39–8.70) No blood pressure check 6.04 (2.77–13.2)	Abnormal blood lipids, diabetes, history of hypertension in pregnancy, smoking	Self-reported hypertension Possible recall bias (OC use)	Intermediate
WHO, 1997 [9]	European countries, 1989–1995	205/472 (hospital controls)	No HTN/no OC 1.0 (referent) No HTN/OC use 3.85 (1.88–7.89) HTN/no OC use 5.43 (2.39–12.4) HTN/OC use 68.1 (6.18–751) Blood pressure check 2.60 (1.15–5.89) No blood pressure check 9.47 (3.72–24.1)	Abnormal blood lipids, BMI, diabetes, history of hypertension in pregnancy, smoking	Self-reported hypertension Possible recall bias (OC use)	Intermediate

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