How contraceptive use affects birth intervals: results of a literature review

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CRD summary
This review assessed the effect of contraceptive use on birth intervals and concluded that contraceptive use was protective against short intervals between births, but findings were mixed and studies were dated and had quality limitations. The authors’ conclusions are likely to be reliable, but may be generalisable only to the mainly low and middle-income countries in which they were undertaken.

Authors' objectives
To assess the effect of contraceptive use on the length of birth intervals.

Searching
PubMed, Scopus, The Cochrane Library and EMBASE were searched for English-language articles published between 1980 and 2008. Search terms were provided.

Study selection
Cohort, cross-sectional or case-control studies with some measure of contraceptive use in a defined birth-interval period were eligible for inclusion. All types of contraceptive methods were eligible and these included traditional or folk methods, natural methods (such as periodic abstinence) and permanent methods (such as sterilisation). Any type of birth interval measure was eligible, such as time between births (birth-to-birth), time from birth to conception and time since last pregnancy or birth (open interval).

The included studies were population-based or clinic-based studies from different countries within Europe, Africa, Middle-East, Asia and in USA. Most studies assessed any contraceptive method or any modern reversible method and used non contraceptive-user comparison groups. All studies reported birth-to-birth or birth-to-pregnancy time intervals. Most studies assessed the effect of contraceptive practice during the birth interval on the duration of the interval; other studies measured any prior contraceptive practice. A range of different outcomes was reported in the studies, such as odds ratio (OR) of a short birth interval, proportion who used contraceptives in the birth-interval by interval length, mean birth-interval by contraceptive use and hazard ratio (HR) of interval length. Studies were published between 1983 and 2005.

Two reviewers independently screened studies for inclusion. Disagreements were resolved through consensus with a third reviewer.

Assessment of study quality
The analytic models in the studies were assessed as to whether contraceptive use was specific to the birth interval being assessed, whether birth interval was explicitly defined, whether known confounders were adjusted for and whether breast feeding and sterilisation were controlled for. Two reviewers independently extracted these data.

Data extraction
Two reviewers independently extracted data that included details of study methods and study results. Results extracted included proportion of participants who used contraceptives for different lengths of birth interval, mean or median birth interval for users and non-users of contraceptives, odd ratio (OR) of a short birth interval and hazard ratio (HR) for interval length.

Methods of synthesis
A planned meta-analysis was not undertaken due to variability between studies. Studies were discussed in a narrative synthesis that grouped studies based on the methods used: studies that used univariate analyses that did not control for possible confounding factors; studies that used multivariate regression analyses that used a pre-defined short birth interval as an outcome measure; and studies that used multivariate regression analyses that used a continuous measure
of birth-interval length.

Results of the review
Fourteen observational studies were included: 11 retrospective cross-sectional studies and three prospective cohort studies. Sample sizes ranged from 309 to 50,596 women. All studies had a weakness in their study design and analysis and some were described as having fundamental flaws. There was a risk of recall bias in the retrospective studies. Four studies did not adjust for known confounders. Five studies did not control for breast-feeding. Six studies did not control for sterilisation.

The results of four studies that used univariate analyses that did not control for possible confounding factors suggested a trend towards longer birth intervals for contraceptive users compared with non users. Without adjustment for confounding factors assessment of the strength of the association was not possible.

The results of five studies that used multivariate analyses and a predefined short birth interval (range five to 24 months) were mixed. One study of women in Pakistan found that contraceptive users had a shorter interval between births compared to non users. The other studies suggested a protective effect against short birth intervals, but the strength of the relationship was variable. The protective effect ranged from a modest increased odds of a short birth interval (OR 1.23, 95% CI 1.10 to 1.38) with injectable contraceptives compared to no or other methods based on data from four sub-Saharan countries to a strong protective effect of insertion of implants in a US study; the odds of conception in the first year following a birth were greatly increased for users of other or no method of contraception (OR 35.2, 95% CI 4.48 to 276.4). One study found that although contraceptive use protected against birth intervals of 15 months or less, the protective effect was reversed by concurrent breast feeding.

The results of five studies that used multivariate models and a continuous measure of the time interval between births were mixed. One study of Nigerian women found that contraceptive users had shorter birth intervals by an average of two weeks compared with non users. The other studies reported longer birth intervals for contraceptive users (range 1.72 months to 20 months, where reported).

Authors' conclusions
The findings were mixed, but suggested that use of contraceptives was protective against short intervals between births; however, the studies were dated and had methodological limitations.

CRD commentary
There were clearly stated inclusion criteria. A number of electronic databases were searched, although relevant studies may have been missed due to language restrictions and the restriction to published studies. Appropriate methods were used to reduce error and bias in the review processes. The decision to undertake a narrative synthesis seemed appropriate and the way in which studies were grouped seemed appropriate. The adequacy of the analytic models used was assessed and taken into consideration in the synthesis and study conclusions.

The authors' conclusions reflected the evidence presented and are likely to be reliable, although the conclusions may be generalisable only to the predominantly low- and middle-income countries in which they were undertaken.

Implications of the review for practice and research
Practice: The authors stated that there was a lack of good-quality evidence to support a policy of expansion of contraceptive care and services.

Research: The authors stated that further research was needed to inform approaches to the promotion of family planning and birth spacing for reduction of maternal and infant mortality and morbidity.

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