Use of metformin for women with polycystic ovary syndrome†

Background

Polycystic ovary syndrome (PCOS) affects up to 15% of women of reproductive age and is characterized by hyperandrogenism, menstrual disturbance, anovulatory infertility and obesity. A large body of evidence has indicated that increased insulin resistance and compensatory hyperinsulinaemia play a key role in the pathogenesis of PCOS. At least 40% of women with PCOS are obese and are more insulin resistant than weight-matched individuals with normal ovaries. Obesity, and particularly abdominal obesity as indicated by an increased waist:hip ratio, is correlated with reduced fecundity, menstrual disorders and hyperinsulinaemia. Metformin, an oral anti-diabetic, reduces serum insulin concentrations and improve the symptoms of PCOS. The aim of this systematic review (Tang et al., 2012) is to ascertain the effectiveness of metformin in improving reproductive outcomes in women with PCOS.

Methods

The Cochrane Library, MEDLINE, Cumulative Index to Nursing and Allied Health Literature and EMBASE were searched up to October 2011 for randomized trials compared metformin with placebo or no treatment for women with PCOS. The outcomes include ovulation (not discussed here), clinical pregnancy and live births. Pooled relative risks (RRs) were calculated using a random effects model.

Results

Thirty-eight trials were included with total participants of 3495. The number of participants in the studies ranged from 16 to 626. The duration of the trials ranged from 4 to 48 weeks; the median daily dose of metformin was 1500 mg. Pregnancy was reported by 24 trials and the live birth rate was reported by 14 trials. Clinical pregnancy rates were improved for metformin versus placebo [pooled RR: 1.85, 95% confidence interval (CI): 1.05–3.26, 8 trials, 707 women] and for metformin and clomiphene versus clomiphene alone (pooled RR: 1.46, 95% CI: 1.03–2.08, 11 trials, 1208 women). However, there was no evidence that metformin improved live birth rates, whether it was used alone (pooled RR: 1.65, 95% CI: 0.50–5.40, 3 trials, 115 women) or in combination with clomiphene (pooled RR: 1.13, 95% CI: 0.82–1.55, 7 trials, 907 women) (Fig. 1).

Conclusion

Metformin improves pregnancy rates when compared with placebo, and in addition to clomiphene compared with clomiphene alone, but not when compared directly with clomiphene. Metformin does not improve live birth whether it is used alone or in combination with clomiphene. Thus, the benefit of metformin in the improvement of reproductive outcomes in women with PCOS appears limited.

Reference


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