Systematic review and meta-analysis of safety of laparoscopic versus open appendicectomy for suspected appendicitis in pregnancy

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Background: Laparoscopic appendicectomy has gained wide acceptance as an alternative to open appendicectomy during pregnancy. However, data regarding the safety and optimal surgical approach to appendicitis in pregnancy are still controversial.

Methods: This was a systematic review and meta-analysis of studies comparing laparoscopic and open appendicectomy in pregnancy identified using PubMed and Scopus search engines from January 1990 to July 2011. Two reviewers independently extracted data on fetal loss, preterm delivery, wound infection, duration of operation, hospital stay, Apgar score and birth weight between laparoscopic and open appendicectomy groups.

Results: Eleven studies with a total of 3415 women (599 in laparoscopic and 2816 in open group) were included in the analysis. Fetal loss was statistically significantly worse in those who underwent laparoscopy compared with open appendicectomy; the pooled relative risk (RR) was 1.91 (95 per cent confidence interval (c.i.) 1.31 to 2.77) without heterogeneity. The pooled RR for preterm labour was 1.44 (0.68 to 3.06), but this risk was not statistically significant. The mean difference in length of hospital stay was −0.49 (−1.76 to −0.78) days, but this was not clinically significant. No significant difference was found for wound infection, birth weight, duration of operation or Apgar score.

Conclusion: The available low-grade evidence suggests that laparoscopic appendicectomy in pregnant women might be associated with a greater risk of fetal loss.

Comments:

1) This meta-analysis came to a relevant result: the relative risk (RR) of fetal loss in pregnant women who underwent laparoscopic appendectomy was doubled when compared with the open technique. The pooled RR for preterm labor was increased in the laparoscopic group, but this difference was not statistically significant. No significant difference was found for surgical site infection, birth weight, duration of

2) The main limitation of the present paper is the small number of patients enrolled in the analyzed studies: 10 of 11 studies had a population between 6 and 57 patients; only McGory enrolled 3133 patients. As we can easily deduce, this imbalance (87% of the patients come from McGory’s study) negatively affected (center effect) the results. If we excluded McGory’s study and we considered only the other 10 studies, the statistically significant difference in terms of fetal loss disappears. (4/141 = 2.8% laparoscopic technique Vs 4/133 = 3.0% open technique).

3) Preterm-delivery was analyzed in only seven studies. This analysis lacked statistical power and was unable to come to any conclusion because of the small number of patients in the laparoscopic group.

4) The majority of the analyzed studies are retrospective. Only one prospective randomized trial has been included in the meta-analysis. This reduces the level of evidence related to this analysis.

5) With the exception of McGory’s study, the risk of bias errors is high in this meta-analysis because of the lack of detailed descriptions. In particular, the detailed description of the outcomes was described in 6 of 11 studies and the surgical technique in 7 of 11. Moreover none of the studies described the degree of appendicular inflammation nor the clinical complications (i.e. gangrene, perforation...). This represents a serious confounding factor. Last, there was no information on surgeon experience in mini-invasive surgery.

6) The authors’ opinion was that pneumoperitoneum, reduces venous return, induces hypotension and maternal-fetal hypoxia that lead to fetal acidosis. However, this issue still remains controversial.

7) Waiting for more detailed studies, when we are faced with acute appendicitis in women of childbearing age, the choice between the
laparoscopic and open approach should be based on patient characteristics and surgeon laparoscopic experience.

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