Background: Research has revealed associations between pregnancy smoking and adverse pregnancy, birth, and long term child health and developmental outcomes. Less well studied and understood is the potential role of environmental tobacco smoke (ETS). The goal of the current study was to examine links between pregnancy smoking, ETS, and birth outcomes, the relative risk of each, and the possible role of timing of exposure. Methods: 665 pregnant women from Southern Appalachia were recruited at entry to prenatal care based on smoking and smoke exposure status. Interviews were conducted and medical charts were reviewed. Results: Women who smoked throughout pregnancy had significantly worse birth outcomes, including decreased birth weight and length, reduced gestational length, increased risk of fetal loss, and increased rates of NICU admission, compared with those who quit smoking by 20 weeks. Smoking at least a half pack per day was associated with the highest risk. Women with significant ETS exposure throughout pregnancy had birth outcomes comparable to, and in some cases worse than, those of active smokers, and significantly worse than those who smoked early in pregnancy but quit by 20 weeks. Risk was moderately reduced for those who eliminated active ETS exposure by 20 weeks. Effects remained after control for potential confounders. Conclusions: In this sample, pregnancy ETS exposure was as detrimental as pregnancy smoking with respect to birth outcomes. In addition, the effects of both smoking and ETS were minimized if eliminated by 20 weeks. Findings underscore the need to address both active smoking and ETS during pregnancy, and the benefits of smoking cessation and elimination of ETS even into the second trimester.

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