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About the fetal risks from diagnostic use of radiation during pregnancy: A systematic review and proposal of a clinical protocol

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Aim: Analyze existing literature about the fetal risks of radiation exposure, producing a clinical protocol to guide radiation exposure in a clinical setting.

Methods: An initial query was made on PubMed: "Diagnostic radiography in pregnancy AND radiation", with the limits "published from January 1st 1993 to December 31st 2013, in English or Portuguese". The articles that presented our aim were analyzed according to their MESH terms and created the final query: "((radiation) AND pregnancy) AND diagnostic imaging". Research on April 15th of 2014, with the same limits, on PubMed gathered 688 articles; on SCOPUS 245 additional articles. After reading the title and abstract, 298 articles remained. 179 allowed access to full text and were analyzed according to inclusion and exclusion criteria. A total of 103 articles were used and an additional one regarding in utero radiation exposure from atomic bombs. The PRISMA statement was followed.

Results: Deterministic effects like pregnancy loss, congenital malformations, growth retardation and neurobehavioral abnormalities have threshold doses greater 100-200 mGy, being the risk considered negligible at 50 mGy. No diagnostic exam exceeds this limit. The most crucial time to avoid radiation exposure is from the 8th to the 15th week of gestation. The risk of carcinogenesis is slightly higher than the general population, although very similar. Intravenous contrast is discouraged, except in highly-selected patients.

Conclusion: Measures to diminish radiation are essential and affect the fetal outcome. Nonionizing procedures should be considered whenever possible and every radiology center should have its own data on fetal radiation exposure.

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