REVIEW OF EPIDEMIOLOGICAL STUDIES ON CANCER RISKS FOLLOWING DIAGNOSTIC RADIATION EXPOSURE IN CHILDREN

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Background and aims: The question of cancer risks associated with postnatal diagnostic medical exposure involving ionising radiation in childhood is particularly relevant given the growing use of diagnostic examinations, especially computed tomography scans, in children. Although several studies have indicated that in utero exposure to radiation from diagnostic radiography is associated with increased risk of cancer, the association between postnatal diagnostic exposure and risk of cancer remains controversial (Linet, 2009, Schutz-Rath, 2008, Wakeford, 2008).
Methods A review of epidemiological studies, published in English between 1990 and 2011, on cancer risks following diagnostic radiation in children is proposed following the publication of 3 recent relevant studies (Ronckers, 2010, Bartley, 2010, Rajamaran, 2011).
Results 12 case-controls studies and 7 cohort studies have been identified**.** Heterogeneous results were found for postnatal diagnostic medical exposures and leukaemia. An excess of breast cancer has been observed in cohorts of girls and young women subjected to multiple diagnostic radiation exposures for spine deformities. No significant effect of postnatal exposures was observed for other cancer sites (Non–Hodgkin lymphomas, solid tumours and brain tumours). One of the key concerns is that results from most of the epidemiological studies on postnatal radiography are based on data from interviews with parents allowing for the possibly of bias. Besides, most studies have limitations in study size and involve very low exposure.
Conclusions
As the expected cancer risks are small, epidemiological studies require very large sample sizes and long periods of follow-up combined with a good dosimetry assessment. In this context, newly launched cohort studies on cancer risks associated with exposures to CT scans during childhood will provide new results in the future.

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