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Letter to the Editor

Association of malignancy with repeat diagnostic CT in small children

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The article on "potential association of malignancy and repeat diagnostic computerized tomography (CT) in children with ventriculoperitoneal shunts: Report of two cases" published in J Pediatr Neurol made interesting reading [1]. A similar case was encountered by us. A 16-year-old male boy had undergone nearly 17 CT scan screenings during the first 3.5 year's of his life for shunt blocks. Thirteen of 17 CT scans were done within the age of 2 years (7 within 6 month of life), the first one was performed within a week following his birth. The ventriculoperitoneal shunt was done for post hemorrhagic hydrocephalus and he required multiple revisions following first installation. The boy attended our outpatient department for swelling in the neck and difficulty in cognition. Examination revealed a cervical and submandibular lymphadenopathy and compromise of higher mental functions. The other lymph nodes were not enlarged on palpation. The cervical lymph nodes were soft and discrete, while few submandibular nodes were matted. There was no organic involvement on further screening of abdomen and chest, the bone marrow evaluation was done at hematology department. The excisional biopsy of submandibular lymph node revealed Hodgkin's lymphoma, which was leveled as stage I. Since there was no cranial lesion on CT screening, hence he was managed by chemotherapy following other relevant investigations at clinical hematology department. Follow up at 4 months showed a significant regression of lymph nodes.

Radiation is now well recognized to be a trigger for cancer. This process is better known as radiation associated carcinogenesis (RAC). Many case reports and series exist in the literature on RAC [2,3]. Ionizing radiation is still the only proven causative factor in the development of meningiomas [2]. Interestingly, most of the literature deals with RAC following therapeutic radiation exposure, such as following conventional radiotherapy or following radio surgery. On the contrary, there is no much information available on RAC following diagnostic radiation exposure such as diagnostic X-ray studies, CT scanning, dental radiographic examination and diagnostic angiography, while these are more common and frequent forms of radiation exposure. The authors of the article have explored a valuable and important medical issue related with a potential association of malignancy on account of repeated diagnostic radiation exposure. There are only anecdotal reports available revealing such a relationship [1]. These reports, however establish a potential relationship between repeated diagnostic radiation exposure and carcinogenesis, but do not offer a causal relationship. It is described that even a single photon

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can cause mutation, which can eventually cause carcinogenesis [4]. However, many radiation technicians and radio-diagnostic personnel are routinely exposed to radiation of their heads, during various diagnostic and therapeutic procedures, but they seldom develop cancer, even though the cumulative radiation exposure for them is high. It is yet to be understood whether small children are more susceptible for RAC following even small doses of radiation. It is difficult to prove at present whether repeated low dose diagnostic radiation exposure is a causative factor for malignancy or it is a mere coincidence and further studies in this field are required to solve this issue in due course of time. It is agreed that diagnostic radiation exposure should be judicious and resorted to only when specifically indicated. If repeated needs for these investigations arise then non-invasive modalities or modalities devoid of Ionizing radiation should be preferred, particularly in small children. Though one cannot scientifically document a cause and effect in the case cited in this letter, it is reasonable to conjecture that the association may be more than casual. Unless one remembers these sporadic anecdotal cases, one may take diagnostic imaging in children too cautiously.

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