

Study of computerized topography (CT Scan) in children with no previous cancer diagnosis in south Karnataka population - Retrospective study

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Abstract

Background: CT scans of the children for medical diagnosis who had no previous history of malignancy, severity of CT scan radiation were noted. **Method:** 93 children of different age groups were studied and exposed to CT scan 28 (30.1%) Head, 17 (18.2%) chest, 7(7.52%) Neck, 12(12.9%) Spine 13(13.9%) Abdomen, 11(11.8%) pelvis 5(5.37%) limbs. **Results:** There was severity of CT scan radiation observed in exposure of brain due to repeated exposure to CT scan radiation. **Conclusion:** As the children have less immunity as compare to adult. Hence repeated exposure to CT scan must be avoided because children were more sensitive to radiation

Key Words: Computed Tomography, Radiations, malignancy, Central Nervous system, sensitive.

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INTRODUCTION

CT (Computed Tomography) is a valuable and medically beneficial imaging technology, its use is increasing in all industrial countries, where it is replacing conventional X-ray studies'. But the patients is exposed to CT scan considerably high dose of ionizing radiations deliver more than requirement cause high risk of death of tissue malignancy as well for long life span after exposure^{2,3,4}. On the contrary in certain diseases of children CT scan exposure becomes un-avoid able. Hence dosage radiation

was used to study the disease of different parts of the body so that the children exposed to CT scan would lead normal life in future too. Hence attempt was made to study the children who had no previous history of Malignancy and severity of CT scan was observed.

MATERIAL AND METHODS

93 children aged between 8 to 16 years performed CT scan for non-cancerous diseases at AIMS B G Nagar-571448, Mandya- (dist), Karnataka.

Inclusive criteria: The children having non-malignant tumours, abscess, not responding to antibodies were selected for study.

Exclusion criteria: Children having history of malignancy, immune compromised disease, IVth grade mal-nutritious were excluded from the study.

Methods: CT scan was performed at different regions like head, neck, chest abdomen, pelvis, spine, limbs because of respective non-malignant pathologies. The duration study was Aug-2016 to Jan-2017.

Statistical Analysis: Children exposed to different parts of the body were classified with percentage. The ratio of male and female children were 2:1

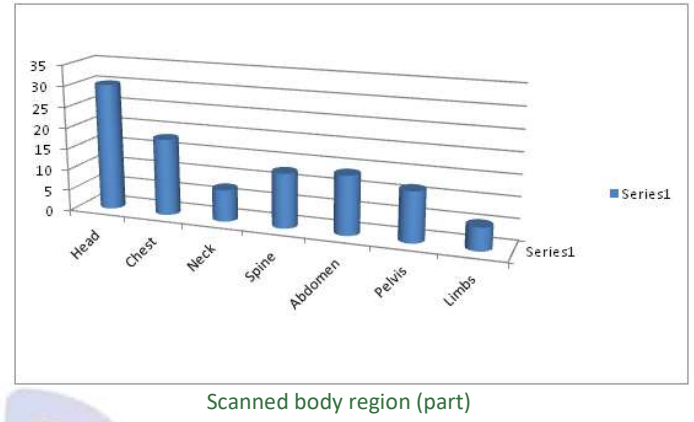
OBSERVATION AND RESULTS

Table-1 Study of CT scan in children of different parts of the body was

Table 1: (Total No. of patients -93)

Sl No	Scanned body region (part)	No of patients	Percentage (%)
A	Head	28	30.1
1	Trauma	9	
2	Congenital diseases	6	
3	Cerebral edema	7	
4	Headache	6	
B	Chest	17	18.2
1	Congenital diseases	7	
2	Respiratory system	5	
3	Infections and parasitic disease	3	
4	Lymphadenopathy	2	
C	Neck	7	7.52
1	Cyst/ Nodes	3	
2	Lymphadenopathy	2	
3	Hematoma	2	
D	Spine	12	12.9
1	Trauma	7	
2	Disease of musculoskeletal system	5	
E	Abdomen	13	13.9
1	Trauma	2	
2	Ascitis	3	
3	Renal calculus	6	
4	Pancreatitis	2	
F	Pelvis	11	11.8
1	Trauma	2	
2	Hematoma	3	
3	Genito-urinary disease	4	
4	Musculoskeletal	2	
G	Limbs	5	5.37
1	Trauma	2	
2	Musculoskeletal diseases	3	

- E. Abdomen had 13(13.9%) scanning 2- had trauma, 3- Ascites, 6-renal calculi, 2-pancreatitis.
- F. Pelvis scan had 11(11.8%) included 2-trama, 3-haematoma, 4- Genito-urinary disease.2-musculoskeletal diseases
- G. Limbs- (both upper and lower limbs) 2- trauma, 3- musculoskeletal disorder.



DISCUSSION

In the present of use of CT in children, had no history of cancer diagnoses. The scanned part of head had 28 (30.1%) patients exposure which had 9-trauma, 6-congenital disease 7- cerebral oedema,6- had headache, (b) Chest region had 17 (18.2%) scanning 7 congenital disease,. 5- respiratory system, -infections with parasite,. disease , 2-lymphadenopathy. (c) In exposure of Neck 3-had cyst/nodes 2-, had lymphadenopathy 2-had hematoma- (d) In the exposure of spine 7-had trauma, 5-had diseases of musculoskeletal system. (e) abdomen exposure had -2 had trauma -3 - had ascities 6-had renal calculi- 2 had pancreatitis (f) In the exposure of pelvic scan -2 had trauma 3-had hematoma, 4- had Genito urinary disease, 2- had musculoskeletal diseases (g) In the exposure of limbs, 2- had trauma, 3-musculoskeletal disorders (Table-1). These finding were more or less in agreement with previous studies^{5,6,7}. In the present study the high rate of exposure was head (i.e. Brain) 28 (30.1%) which included head injury (trauma), congenital disease like absence of Fontanelle or non- fusion of fontanelle reduced cranial index, Cerebral oedema (hydrocephalus) and headache there was high rate of exposure to radiation of CT scan^{8,9}. But it was also reported that frequent exposure of CNS leads to malignancy of brain tissue¹⁰. Remaining organs or parts exposure had least recurrence of malignancy was reported. The prevalence of malignancy in repeated CT scan of cerebral nervous system (CNS) could be due to following hypothesis, as brain is in the semi-liquid form and CSF being modified

- A. Head region had 28(30.1%) 9-had trauma, 6 had congenital diseases, 7 cerebral oedema, 6 headache.
- B. Chest region had 17(18.2%) scanning, 7 congenital disease,. 5- respiratory system, -infections with parasites disease, 2- lymphadenopathy
- C. Neck had 7 (7.5%). Scanning- 3-cyst/nodes, 2- lymphadenopathy 2- hematoma
- D. Spine had 12 (12.9%) scanning- 7-trauma, 5 had disease of musculoskeletal disorders.

tissue fluid might carry the infections throughout brain and infections might, have been trapped in the choroid plexus of ventricles and grow in the ventricle as ventricles are quite spacious. Moreover till 7 th years of age brain is in the growing stage but to mal-nutrition or under-nutrition's there may be retardation or slow growth rate in the brain. Hence there could be dominance of infections in pre-mature neurons and neuroglia Hence repeated exposure of CT scan radiation must be avoided because children are more sensitive to radiation, as they have less immunity, which may results into growth of malignancy.

SUMMARY AND CONCLUSION

The present study of use of CT scan in children with no previous cancer diagnosis is quite useful to radiologist physician and surgeon to avoid frequent exposure CT scan and evaluate the magnitude of radiation exposure in the children and efficiency of CT use) in relation to clinical outcomes, compared with other strategies of diagnosis and follow up. This study demands further cytological, patho-physiological, nutritional, genetic study because exact pathogenesis of malignancy cells still un-clear.

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