

Epidemiology of CT in an Irish Pediatric Emergency Department

Sláinte Leanaí Éireann
ag Cromghlinn



Children's Health Ireland
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Purpose

- To evaluate the epidemiology of CT scans in an Irish Pediatric Emergency Department.
- In recent years, there has been a global movement towards more judicious use of computed tomography (CT) imaging in an attempt to reduce exposure of pediatric patients to ionizing radiation. In addition to the health risks involved, there are economic and resource utilisation implications.
- CT overuse may also result in further costs and longer patient stays due to the need to investigate incidental findings.
- CT utilisation rates across national jurisdictions vary widely due to a number of structural, process and outcome related factors. There is currently no published data describing the epidemiology of CT from an Irish Pediatric Emergency Department in a tertiary referral centre.

Methods

- We performed a retrospective study by searching the Irish National Integrated Medical Imaging System (NIMIS) for CT imaging studies performed at the request of the paediatric emergency department physicians from Our Lady's Children's Hospital Crumlin for the years 2018-2020 inclusive.
- These scans were then categorised into “working hours”, i.e. 9am to 5pm Monday to Friday, excluding public holidays, and “out of hours”.
- The scan reports were also analysed to ascertain if the scan had yielded a “positive” finding, i.e. evidence of pathology that would change the patients management, or disposition (e.g. fit for discharge or needing to be admitted for specialty care).
- These data were tabulated and analysed using Microsoft Excel.

Results

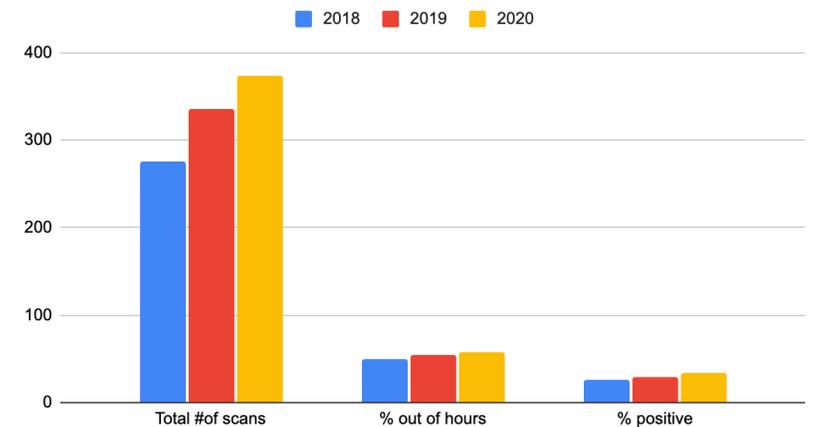
- 984 scans in total were identified;
 - 275 in 2018
 - 336 in 2019
 - 373 in 2020
- Of these, an increasing proportion were performed out of hours over the timeline of the study period;
 - 49.1% in 2018
 - 54.5% in 2019
 - 57.6% in 2020).
- The proportion of scans performed that yielded a positive result also increased each year within the study period, going from 26.5% in 2018, to 29.2% in 2019 and 30.2% in 2020.

Year	Total #of scans	Out of hours	% out of hours	Positive	% positive
2018	275	135	49.1	73	26.5
2019	336	183	54.5	98	29.2
2020	373	215	57.6	126	33.8
Total	984	533	54.2	297	30.2

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Summary Figures



Conclusion

- Our data show an increasing number of CT scans being performed at the request of the Emergency Department physicians on a year to year basis for the study period.
- Interestingly, despite the increased number of scans performed, the proportion of positive results also increased, going from just over a quarter of performed scans yielding a positive result in 2018, to more than a third in 2020.
- This suggests that there is an appropriately judicious use of CT scanning being performed in our Pediatric Emergency Department. This is encouraging, given the number of recent studies that have shown that nearly a quarter of CT scans performed in the general population are inappropriate.



Conclusion

- It is notable also that this occurred in the context of the global Covid-19 pandemic, which might have been expected to result in a reduced number of pediatric emergency department attendances due to restrictions on activity within the general population.
- Our results show that the demand for CT scanning is increasing, even over a relatively short period, which will have implications for the planning and resourcing of imaging for pediatric emergency departments in Ireland in the near future.
- The number of these scans that yielded positive results show that this reflects a genuine need for imaging, rather than an increase in unnecessary imaging requests.



References

- 1. Louie, J.P., et al., *Reduction of paediatric head CT utilisation at a rural general hospital emergency department*. *BMJ Quality & Safety*, 2020. **29**(11): p. 912-920.
- 2. Frush, D.J., et al., *Utilization of computed tomography imaging in the pediatric emergency department*. *Pediatr Radiol*, 2020. **50**(4): p. 470-475.
- 3. Ohana, O., et al., *Overuse of CT and MRI in paediatric emergency departments*. *Br J Radiol*, 2018. **91**(1085): p. 20170434.