

Ionising radiation (medical exposure) regulations (Northern Ireland) 2000 and their implications for Accident and Emergency (A&E) doctors in training

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SUMMARY

With the introduction of the Ionising Radiation (Medical Exposure) Regulations (Northern Ireland) 2000 (IRMER) the medical practitioner faces greater accountability when requesting radiological investigations. The referrer (usually a doctor or dentist) must supply sufficient medical data to justify radiation exposure to a patient. These regulations can lead to criminal prosecution if breached. Our objectives were to identify the level of unjustified requests for plain abdominal radiography among A&E doctors and whether there is a statistically significant difference in the justification of request between doctors of differing experience.

We reviewed and prepared statistical analysis of 100 A&E request forms for plain abdominal radiography. Royal College of Radiologist Guidelines were used as a "Gold standard" for justification of the investigation.

A&E doctors of less than six months experience are at greater risk of breaching these regulations when requesting plain abdominal films, when compared to more experienced doctors.

This is a serious issue which should be addressed at undergraduate and pre-registration level in addition to ongoing audit.

INTRODUCTION

Plain abdominal films (PAFs) in Accident and Emergency Departments (AEDs) have been shown to be of low diagnostic yield.¹ Despite Royal College of Radiologists guidelines² (tables I & II) PAFs are still over utilized in AEDs for a variety of condition.¹ With the introduction of the Ionising Radiation (Medical Exposure) Regulations³ (Northern Ireland) 2000 (IRMER) the medical practitioner faces greater accountability when requesting radiological investigations. These regulations define four main duty holders: employer, practitioner, operator and referrer. A referrer is a health care professional who requests a radiological investigation or treatment. The referrer (usually a doctor or dentist) must supply sufficient medical data to justify radiation exposure to a patient. These regulations can lead to criminal prosecution if breached. Previous studies have been done on variation of PAF interpretation⁴ but not on variation of justification with respect to clinical experience.

Our aims were to identify the level of unjustified requests for plain abdominal radiography among AED doctors and to determine whether there was a statistically significant difference in the justification of requests between doctors of differing experience.

METHODS

Over a six-week period, a list of PAFs requested by the AED of Belfast City Hospital was obtained from the Radiology department. The clinical information in the notes was scrutinised to determine whether a request was justified. The criteria for justification were obtained from the RCR working party booklet "Making the best use

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TABLE I
Main indications for Plain Abdominal Radiography using Royal College of Radiologists guidelines.

Suspected small or large bowel obstruction.
Acute flare of inflammatory bowel disease.
Acute abdominal pain requiring admission and surgical consideration.
Sharp or toxic swallowed foreign body.
Intussusception
Urology (Belfast City Hospital local policy to use "Kidney, ureter & bladder" views for work up of urological complaints).

TABLE II

Conditions which Royal College of Radiologists guidelines specifically mention as not needing Plain Abdominal Radiography as part of initial clinical assessment.

Appendicitis
Acute pancreatitis
Abdominal mass
Swallowed coins (Indicated if coin not passed at 6 days or suspected obstruction)
Swallowed teeth
Constipation (Adult or child)

of a Department of clinical radiology". This booklet is issued to all doctors when they take up post in this particular Accident & Emergency department. Doctors were subdivided by experience as follows: Group 1 (less than 6 months full time AED work), Group 2 (greater than 6 months full time AED work).

Group 1 contained 5 full time senior house officers (SHO) with no AED experience.

Group 2 contained 12 doctors: 2 SHOs, 2 Registrars, 2 Consultants, 1 Staff Grade and 5 sessional hospital practitioners all with at least 6 months' full time AED experience.

RESULTS

Over 6 weeks 100 PAFs were ordered, representing roughly 2% total new attenders (5274

patients). 62 patients were female and 38 were male. There was a wide age range of patients x-rayed: 13 patients less than 10 years and 5 patients over 80 years. Abdominal pain was the commonest presenting feature (Table III). Group 1 saw a total of 2217 new attendances in this period and group 2 saw 2511 new patients. This leaves a shortfall of 546 patients which represents those who were seen by nurse practitioners, ward doctors or those who did not wait.

Overall, 58% of PAFs were not justified. Group 1 ordered 42 PAFs of which 29 were not justified (69%)(Table IV). Group 2 ordered 58 PAFs of which 29 were not justified (50%). Chi squared testing of Group 1 (13 justified/42) versus Group 2 (29 justified/58) gives a p-value of 0.09 with Yates correction.

TABLE III

Presenting Features in Patients sent for Plain Abdominal Radiography

Presenting Feature	Number of Patients (Total 100)
Abdominal Pain	41
Simple Constipation	19
Obstructive Symptoms	9
Lower Urinary Tract Infection Symptoms	9
Ingested Foreign Body	8
Gastrointestinal Bleed	7
Others	7

Table IV

Relative Proportion of Justified to Not Justified Plain Abdominal Radiographs for Groups 1 & 2

A&E Experience	Justified	Not Justified	Total
< 6 Months	13 films 31%	29 films 69%	42 films 100%
> 6 Months	29 films 50%	29 films 50%	58 films 100%

CONCLUSIONS

Most PAFs ordered were not indicated. There was more appropriate requesting of PAFs by doctors of greater than 6 months AED experience than those with less. We are aware that the RCR guidelines are simply that, and a senior clinician may wish to disregard them in certain cases where personal clinical experience is at odds with the protocol. However it is the experience of the senior doctor which allows them to override these guidelines. We believe that inexperienced doctors are simply not applying the guidelines due to lack of awareness and over-investigating patients due to a fear of missing serious pathology. Junior doctors working in AEDs are therefore putting themselves at risk of breaching the IRMER regulations. These regulations have the force of criminal law and can result in prosecution if breached.

We believe that following 6 months full time experience in an AED there is a significant improvement in the justification of requested x-ray. Unfortunately once this experience is gained many SHOs will leave to work in other specialties where they will face a new set of clinical challenges. Equally inexperienced staff then replaces these SHOs and the cycle of over-investigation of AED patients continues.

We believe that measures must be taken to protect inexperienced AED SHOs from breaching these regulations and yet at the same time allow enough patient interaction to facilitate training. These measures could include ongoing audit of radiological investigation requests jointly performed by Radiology and Accident and Emergency Departments with active participation by all medical staff. Increasing the number of consultants in AEDs could improve the quality of both requesting of radiography and the supervision of inexperienced SHOs. These issues should have a higher profile in undergraduate and pre-registration training than is currently the case.

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