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Radiologists' Training, Experience, and Attitudes About Elder Abuse Detection

Tony Rosen¹, Elizabeth M. Bloemen², Jasmin Harpe^{1,3}, Allen M. Sanchez⁴, Kevin W. Mennitt⁴, Thomas J. McCarthy¹, Refky Nicola⁵, Kieran Murphy⁶, Veronica M. LoFaso², Neal Flomenbaum¹, and Mark S. Lachs³

¹Division of Emergency Medicine, Weill Cornell Medical College, 525 E 68th St, Rm M130, New York, NY 10065

²University of Colorado Medical School, Aurora, CO

³Division of Geriatric and Palliative Medicine, Weill Cornell Medical College, New York, NY

⁴Department of Radiology, Weill Cornell Medical College, New York, NY

⁵Department of Imaging Sciences, University of Rochester Medical Center, Rochester, NY

⁶Department of Medical Imaging, University of Toronto, Toronto, ON, Canada

Abstract

OBJECTIVE—Elder abuse is underrecognized, and identification of subtle cases requires a high index of suspicion among all health care providers. Because many geriatric injury victims undergo radiographic imaging, diagnostic radiologists may be well positioned to identify injury patterns suggestive of abuse. Little is known about radiologists' experience with elder abuse. Our goal was to describe knowledge, attitudes, training, and practice experience in elder abuse detection among diagnostic radiologists.

SUBJECTS AND METHODS—We conducted 19 interviews with diagnostic radiologists at a large urban academic medical center using a semistructured format. Data from these sessions were coded and analyzed to identify themes.

RESULTS—Only two radiologists reported any formal or informal training in elder abuse detection. All subjects believed they had missed cases of elder abuse. Even experienced radiologists reported never having received a request from a referring physician to assess images for evidence suggestive of elder abuse. All subjects reported a desire for additional elder abuse training. Also, subjects identified radiographic findings or patterns potentially suggestive of elder abuse, including high-energy injuries such as upper rib fractures, injuries in multiple stages of healing, and injuries inconsistent with reported mechanism.

CONCLUSION—Radiologists are uniquely positioned to identify elder abuse. Though training in detection is currently lacking, providers expressed a desire for increased knowledge. In addition, radiologists were able to identify radiographic findings suggestive of elder abuse. On the basis of

Address correspondence to T. Rosen (aer2006@med.cornell.edu).

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these findings, we plan to conduct additional studies to define pathognomonic injury patterns and to explore how to empower radiologists to incorporate detection into their practice.

Keywords

elder abuse; elder abuse radiology findings; geriatric injury; intentional injury

Elder abuse is common and has serious consequences, but it is underrecognized. As many as 10% of older U.S. adults experience elder mistreatment each year [1, 2], and evidence suggests that victims have dramatically increased mortality and morbidity [3]. Mistreatment may include physical abuse, sexual abuse, emotional or psychologic abuse, neglect, or financial exploitation [1, 2]. Unfortunately, fewer than 1 in 24 cases of elder abuse are identified and reported to the authorities [1, 2]. Evaluation by health care providers represents a critical but often missed opportunity to identify elder abuse, because medical evaluation for acute injury or illness is frequently the only nonfamily contact for isolated older adults [1, 4]. Though extreme cases of mistreatment may be apparent on a cursory assessment, most are subtle [5] and require all providers to be vigilant for clues.

Because many geriatric patients, particularly those with acute injuries, undergo radiographic imaging, diagnostic radiologists may be well positioned to raise suspicion for mistreatment [6]. Imaging findings pathognomonic for or highly indicative of child abuse are well established in the literature and play a critical role in child abuse detection [7, 8]. Identifying and reporting these findings is a core component of radiologist training and practice. In contrast, little radiology literature currently exists describing imaging correlates of elder abuse. To our knowledge, Murphy and colleagues' [6] review of injury patterns in physical elder abuse is the only published article in the peer-reviewed radiology literature that focuses on the topic. In addition, little is known about radiologists' experience with elder abuse. Our goal was to describe formal and informal training, experience, and attitudes in elder abuse detection among diagnostic radiologists.

Subjects and Methods

Study Design

We used semistructured interviews to conduct a qualitative analysis of the formal and informal training, experience, and attitudes of diagnostic radiologists regarding elder abuse detection, topics about which little is currently known. We intended that the themes generated from this study would improve understanding and inform future research. We developed a semistructured interview guide that included the following questions: Have you received any training, formal or informal, in radiologic findings that may indicate elder abuse? Do you think you encounter cases with evidence of elder abuse in your practice? Do you think there may be radiologic findings that may suggest elder abuse or are pathognomonic for it? Do you think that additional training for diagnostic radiologists about elder abuse detection would be helpful? The interview guide was piloted for content and comprehension and was modified according to suggestions made during this preliminary phase. The complete guide is given in Appendix 1. The study was approved by the Weill

Cornell Medical College institutional review board. We used the Consolidated Criteria for Reporting Qualitative Research to guide collection, analysis, and reporting of the data [9].

Setting and Participants

We interviewed diagnostic radiologists at a large urban academic medical center with a diagnostic radiology residency training program and fellowship training in seven subspecialties, including emergency radiology and neuroradiology. Participants were recruited through individual e-mails by one of the authors, a current diagnostic radiology resident at the institution. We used purposeful sampling in recruitment to ensure a range of relevant viewpoints among diagnostic radiologists, attempting to include specialists in emergency radiology and neuroradiology, who might be most likely to see elder abuse as part of their practice. We included attending physicians with both extensive and limited posttraining experience, as well as resident physicians.

Qualitative Data Collection

All interviews were conducted between August and December 2014 by two of the authors. The interviewers were an emergency physician and public health researcher with experience in elder abuse research and qualitative facilitation. Each interview was audio recorded and professionally transcribed.

Data Analysis

The interview transcripts were coded and analyzed in detail by the lead author using content analysis [10]. We developed a set of codes a priori and an additional set of codes that emerged from the data. Analysis began while interviews were still ongoing and was conducted iteratively. Coding was reviewed by the second author, and discrepancies were resolved by consensus. We continued to recruit participants until we reached data saturation. The results of the coding were reviewed, and themes were discussed with the investigative team.

Results

Characteristics of Participants

We interviewed 19 diagnostic radiologists, including 13 attending radiologists and six diagnostic radiology residents. Among the attending physicians, six were emergency radiologists and seven were neuroradiologists. Notably, one of the practicing emergency radiologists had also completed a neuroradiology fellowship. Characteristics of these attending participants are described in Table 1. Of the six radiology resident physician participants, two were in their second year of radiology training, two were in their third year, and two were in their fourth and final year. None had previously completed a residency in another specialty. All resident participants reported plans to pursue additional fellowship training, 83% reported a desire to go into academics, and 17% were undecided between academics and private practice. Interviews ranged in duration from 9 to 18 minutes.

Training

Only two participants reported any formal or informal training in elder abuse detection. One attending emergency radiologist reported having seen a brief presentation at a national radiology conference. One resident reported attending a lecture about identifying elder abuse, which occurred during her intern year in internal medicine before beginning the radiology portion of her residency training. Notably, the lecture did not include any radiography.

Though few participants had any training in elder abuse detection, all 19 reported a desire to learn more about the phenomenon and its relevance to radiology practice. Representative responses included the following: neuroradiology attending physician 3 stated, “[Elder abuse training for radiologists] absolutely would be helpful...demographics and why it happens, when it happens, who are the most at-risk people...it should be wrapped up in, for radiologists, the package of...what are the list of things if you see three or more of these things then you should bring it up with the referring physician...like we do with kids.” Radiology resident 2 said, “I think we should at least be aware of it. And if there are findings...that...we should learn about...similar to...child abuse...it would be helpful.”

Experience

No participants reported identifying elder abuse on imaging during independent practice or training, despite a total of 159 years of independent practice and 80 years of training. One participant reported reading images and then testifying in one legal case where elder abuse was already suspected. All 19 subjects reported believing that they missed cases of elder abuse in their practice, emphasizing that they do not typically consider it as a diagnostic possibility when evaluating radiographs. Representative responses included the following: emergency department attending radiologist 1 stated, “There’s not enough awareness of [elder abuse] as an entity...if I see a rib fracture in a kid, I’m going to think child abuse, whereas older people fall...” Neuroradiology attending physician 3 said, “We don’t really look for [elder abuse].” Neuroradiology attending physician 4 said, “I don’t think we miss the injuries, but we wouldn’t interpret them as abuse.” Finally, neuroradiology attending physician 5 stated, “I think it is very likely that I interpret cases of trauma not knowing it is actually a case of elder abuse.”

Potential Imaging Correlates for Elder Abuse

Though none had identified elder abuse radiographically, participants reported believing that imaging correlates of the phenomenon likely exist. Findings suggested by participants as potentially suggestive of elder abuse are given in Appendix 2.

Importance of Collaboration

Given that radiologists do not evaluate patients, participants highlighted the importance of improved collaboration with treating clinicians in identifying elder abuse. They reported that learning about suspicions from the treating provider about potential elder abuse would significantly alter their analysis of radiographs. Though participants reported routinely receiving requests from treating clinicians to evaluate images for potential child abuse, even experienced radiologists reported never having received a request to assess images for

evidence suggestive of elder abuse. Representative responses included the following: Neuroradiology attending physician 1 stated, “With child abuse, often the referring physician will let us know they suspect child abuse. I have yet to have anyone tell me [in an 18 year career] that they suspect elder abuse.” Emergency department attending radiologist 5 said, “If [the treating physician] might raise a suspicion...based on...interviewing the patient and family members...it...might raise some alarm bells for us to read [the radiographic images] in a different way.”

Participants appreciated the potential reticence of treating physicians to document suspicion in the electronic medical record by including it in the clinical narrative. Several recommended a telephone call as an effective informal way to communicate concerns that radiologists could incorporate into their image evaluation: Emergency department attending radiologist 4 said, “Obviously, it’s hard to put into writing when ...it’s just a mild suspicion. Even a telephone call would be fine to say: ‘Could you look—you know, this sounds a little bit concerning. The story doesn’t really fit with what’s happening. Can you look for this?’” Emergency department attending radiologist 5 stated, “Again, it’s, it’s kind of tricky because once you document something like that...you can never take it back, so, I guess maybe just a telephone call would probably suffice.” Finally, radiology resident 1 said, “If there was some way for the referring clinician to alert us, that maybe that’s [elder abuse] one of their differential considerations without necessarily them having to put it in the EMR automatically or put it in the indication, [that would be helpful].”

Participating radiologists also emphasized the importance of knowing the purported mechanism of injury and patients’ functional status in assessing images for potential elder abuse. Evaluating whether injuries are appropriate for a reported mechanism is a core competency of diagnostic radiologists. Also, given that older adults have a broad range of functional statuses, and knowing that this can have a significant effect on interpretation of injury mechanisms, participants emphasized the utility of this information. Unfortunately, participants reported seldom receiving it. Emergency department attending radiologist 5 said, “The ED does not usually provide us with a good history...I may just get ‘fall’ or ‘found down’...I don’t know if they were found down in a nursing home, in their own home, or...in the street.” Neuroradiology attending physician 7 stated, “I don’t think we ever get any information other than somebody fell in a nursing home....”

Discussion

To our knowledge, this is the first study to closely examine diagnostic radiologists’ training, experience, and attitudes about elder abuse. Several important themes emerged from our analysis.

Training in elder abuse for diagnostic radiologists is clearly lacking, with few participants reporting any formal didactic training or even informal training during image review. Despite this, radiologists overwhelmingly expressed a desire for additional knowledge about elder abuse. This suggests that an opportunity exists to incorporate elder abuse detection into diagnostic radiology curricula. This finding is consistent with previous research in primary care providers, who also reported a lack of knowledge and a desire for additional training

[11]. The potential value of additional training has been found for emergency physicians, because those who had elder abuse training during residency reported significantly more cases to the authorities [12]. This additional training may have particular effects for diagnostic radiologists with a practice focus in emergency radiology or neuroradiology.

It was surprising that no participants had any experience with identifying elder abuse, given how common the phenomenon is. Notably, all participants reported believing that they had missed cases in their practice. This underscores the importance of training radiologists and raising their awareness, because elder abuse will not be detected unless it is considered as a differential diagnosis.

In their foundational literature review focusing on injuries in physical elder abuse, Murphy and colleagues [6] identified potential patterns, reporting that two-thirds of injuries that occurred in elder abuse were to the upper extremity and maxillofacial region. Furthermore, they suggested that their findings might lay the groundwork for radiologists to begin to determine imaging correlates for physical elder abuse. In our study, despite a lack of training or experience, diagnostic radiologists unfamiliar with the work of Murphy and colleagues also believe that imaging correlates likely exist. Potential radiographic findings suggestive of elder abuse reported by participants in our study included many of the same findings radiologists use to identify potential cases of child abuse, such as injuries in multiple stages of healing and injuries inconsistent with reported mechanism. Also, our participants identified potential imaging correlates also suggested by Murphy and colleagues, including multiple subdural hematomas and skull fractures. Potential radiographic findings associated with elder abuse may also be linked with patterns of visible injury described in the limited existing evidence-based literature. Researchers have reported that elder abuse victims are more likely than nonvictims to have bruising on the posterior torso [5]. Posterior rib fractures, suggested by our participants, may represent an imaging correlate to this injury. Another injury pattern associated with elder abuse is bruising of the ulnar forearm, which may occur when a victim defends himself or herself from an abuser [5]. Though not highlighted by Murphy and colleagues or participants in our research, this injury may also have an imaging correlate. Fracture of the distal ulnar diaphysis, which is uncommon after a fall or other unintentional injury, may suggest elder abuse. Future quantitative imaging research is needed to identify potential imaging patterns strongly suggestive of or pathognomonic for elder abuse. The work of Murphy and colleagues and the results we describe here provide a starting point.

Radiologists reported believing that improved collaboration with treating physicians and more complete descriptions of the purported mechanism of injury and functional status of the patient would change their perspective when reading images and improve their ability to assess for elder abuse. The value of clinical history in accurately interpreting radiographic images has been well established [13], as has the unfortunately common practice of treating physicians providing little or no clinical narrative when ordering an imaging study [14, 15]. Knowing the reported mechanism and circumstances surrounding an injury and any suspicion that the treating physician has is critical to detect cases of abuse, as has been suggested by Murphy and colleagues [6]. Radiologists appreciated that treating physicians

may be reticent to document their suspicion and recommended telephone calls as a potentially effective informal way to collaborate.

Knowing functional status is a particularly important part of the clinical history in evaluating images in older adults. A radiologist may infer the functional status of a young child from his or her age, information that is always available when interpreting images. Age-related functional status information is a critical tool used by radiologists in assessing the potential for child abuse [16]. Age alone is not enough to know about the functional capabilities of an older adult [17, 18]. An 85-year-old may be living independently and jogging 10 miles daily or may have severe dementing illness and be bedbound in a nursing home. Knowing about a patient's functional capabilities would encourage radiologists to evaluate images differently and improve their ability identify elder abuse. Treating clinicians should routinely provide, and, if necessary, radiologists should proactively request functional status information for injured patients. When appropriate, additional information about the social circumstances in which an injury took place will also be helpful [6]. Clearly, improved communication with treating physicians is critical to empowering diagnostic radiologists to contribute to elder abuse detection.

Limitations

This study has several limitations. Because we interviewed practitioners from a single urban academic radiology department, our findings may not be generalizable. Given that our institution is actively engaged in research and in training residents and fellows, however, it might be anticipated that participants would have more training and experience with elder abuse than diagnostic radiologists in private practice. This suggests that a larger study would likely find even less training and experience in elder abuse among radiologists. Another limitation of our study is that participation was voluntary; therefore, there is the potential for selection bias, with participants' views differing significantly from those of nonparticipants. Notably, however, of the potential participants we approached, only five residents did not participate. In all cases, this was because of scheduling conflicts. In addition, the qualitative nature of the study precludes making quantitative conclusions from findings. Despite these limitations, we believe that this study improves understanding of an underrecognized issue in diagnostic radiologist practice and will inform future research.

Conclusion

Radiologists are uniquely positioned to identify elder abuse. Though training in detection is currently lacking, providers expressed a desire for increased knowledge about elder abuse. In addition, radiologists were able to identify radiographic findings that may be suggestive of elder abuse and focused on improved collaboration with treating providers as critical for improved identification. Future research is needed to define pathognomonic injury patterns and to explore how to empower diagnostic radiologists to incorporate detection into their practice.

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APPENDIX 1: Interviewer Guide

Questions for residents

- What is your current year of radiology training?
- Are you planning on pursuing fellowship training after completion of residency? If so, in what subspecialty? If you are not sure, what is your best guess as we sit here today?
- Do you anticipate practicing in a private practice or an academic institution?

Questions for attending physicians

- How many years have you been practicing radiology since completing your residency or fellowship training?
- Have you completed fellowship training? If so, in what subspecialty?
- If you were to estimate, what percentage of your clinical duties is devoted to interpreting radiologic studies on emergency department patients?

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1. Have you received any training, formal or informal, in radiology findings that may indicate elder abuse?
 - a. If so, what?
 2. Do you think you encounter cases with evidence of elder abuse in your practice?
 - a. If so, with what frequency?
 - b. Can you describe a few examples?
 3. Do you think you miss cases of elder abuse?
 - a. Why?
 4. Do you think there may be radiologic findings that may suggest elder abuse or are pathognomonic for it?
 - a. If so, what are these findings?
 5. If you encountered a case where you suspected elder abuse, what steps, if any, would you take in seeking out any additional clinical information or communicating these findings? (Do you think this is the standard of care? Do you know what the standard of care for a radiologist is, if any exists, for reporting suspected elder abuse?
 - a. Possible follow-up questions depending on response:
 - i. If you would report, to whom?
 - ii. If/how would you document your concerns as part of your read?

- iii. Would you have any concerns about reporting to the treating physicians?
6. How would your management of elder abuse suspicion differ from your management of suspected child abuse?
 - a. Why?
7. Do you think that additional training for diagnostic radiologists about elder abuse detection would be helpful?
 - a. If so, what would be important to include in this training?
 - b. Would you envision something similar or different from training on child abuse detection?
8. Are there any other tools or support systems that would be helpful for you in detecting elder abuse based on radiographic images?
9. Do you have any experience with or interest in forensic radiology? (forensic radiology is the use of radiologic imaging of live and deceased patients for in courts of law)
 - a. Do you think that the field of diagnostic radiology is increasing focus in this area?
10. Is there anything I did not ask regarding elder abuse assessment that you would like to tell me about?

APPENDIX 2: Radiographic Findings Potentially Suggestive of Elder Abuse According to Radiologists

• Upper, posterior, or multiple rib fractures	• Injuries inconsistent with reported mechanism
• Multiple subdural hematomas (particularly of different ages)	• Multiple fractures and head trauma
• Skull fracture	• Spiral fracture
• Small bowel hematomas	• Brain volume loss secondary to malnutrition
• Injuries in multiple stages of healing	• Decubitus ulcers

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TABLE 1

Experience and Practice of Participating Radiologists

Characteristic	Emergency Department Attending Radiologists (n= 6)	Attending Neuroradiologists (n= 7)	Diagnostic Radiology Residents (n= 6)
Male sex (%)	100	86	50
Radiology residency at academic medical center (%)	83	87	Not applicable
Experience after residency (y), median (range)	5.25 (1.5–10)	18 (1.5–39)	Not applicable
Percentage of practice in emergency department, median (range)	100 (65–100)	15 (10–55)	Not applicable