Who's the doctor? Patients' perceptions of the role of the breast radiologist: a lesson for all radiologists

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Objective: The aim of this study was to explore patients' perceptions of the role of the radiologist in their care.

Methods: The questionnaire used was designed in conjunction with a psychologist who had an interest in oncology, and piloted. The final questionnaires were distributed to patients attending the breast clinic at St James's Hospital, Dublin, Ireland, from 1 March to 1 July 2011. Patients requiring imaging (mammography and/or ultrasound) were asked to complete the same questionnaire again after imaging procedures were performed. Paired *t*-tests were used to assess for changes in parameters, including ranking of members of the breast care team in order of perceived importance and levels of anxiety pre and post consultation with the radiologist.

Results: 306 patients were recruited. 76% of patients thought that radiologists were radiographers and only 14% knew that radiologists were medical doctors. Nearly 40% of patients did not consider that radiologists had a role to play in their care. There was no statistically significant difference in the ranking of team members pre and post consultation. There was a significant improvement in patient anxiety levels after consultation with the breast radiologist, which is likely to be due to the patient learning the outcome of tests performed.

Conclusion: There is a lack of awareness amongst patients and amongst our colleagues in paramedical disciplines regarding the roles and responsibilities of the modern radiologist.

Advances in knowledge: Radiology must act to increase public awareness so that future changes in the health service will reflect the scope and importance of the speciality.

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In the early 1900s, radiologists had no formal qualifications and in many instances were photographers and enthusiastic experimenters [1]. Today, radiologists are highly qualified medical practitioners with extensive experience in the fields of post-graduate internal medicine and surgery before making the leap into diagnostic radiology. Far from being photographers, modern radiologists have an important role to play in the diagnosis and management of patients. With the increased demand for image-guided procedures, today's radiologists have frequent contact with patients and a stronger patient–doctor relationship has developed [2].

In spite of this expanded role of the radiologist, a 2008 survey by the American College of Radiology revealed that 50% of Americans did not know if a radiologist interpreted scans or performed them [3]. This is concerning for our profession. A lack of appreciation of the medical qualifications of a radiologist may impact on a patient's decision to follow the advice given to them at the time of an examination or procedure. Furthermore, this lack of awareness on the part of patients could impact on the public health messages distributed by the boards and colleges of radiology.

The purpose of this study was to assess patients' knowledge of the roles and qualifications of the breast radiologist and the impact of a direct interaction with a radiologist on this knowledge. The direct interaction with the radiologist was at the time of a breast ultrasound examination and biopsy if required. Patients were asked to rank members of the breast care team in order of perceived importance before and after consultation with the radiologist. The effect of this consultation on patient anxiety levels was also assessed.

Methods and materials

Patient selection and data collection

We performed the study in our symptomatic breast clinic from 1 March to 1 July 2011. All patients attending the clinic have a breast symptom ranging from breast pain to a palpable lump. Each attendee is seen by a consultant breast surgeon and then referred for same-day mammography and/or breast ultrasound if required. All breast ultrasounds are performed by radiologists who have at least 18 months' experience of working at consultant level. Both male and female consultants participated in the study and on meeting a patient the radiologist was introduced as "Doctor". It

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was also specified to the patient that the radiologist was of consultant grade. Two of the four consultant radiologists had previously undertaken formal communication skills training. The patients attending the clinic see a breast care nurse either after interaction with the radiologist or after seeing the surgeon if no imaging is required.

Prior to attendance at the breast clinic, all patients received an information booklet by post. It outlined the stages involved in attendance at the breast clinic, including the need for imaging for many females after a clinical breast examination. A detailed explanation about mammography and breast ultrasound was provided. On arrival at the breast clinic, all patients were asked to complete a questionnaire that was distributed by clerical staff. Patients who required imaging (mammography and/or ultrasound) were asked to complete the same questionnaire again after imaging procedures were performed. All breast ultrasounds were performed by a consultant radiologist. The questionnaires were distributed by sonographers in the breast radiology department and were identifiable as having been completed by the same patient by the initials, age and occupation provided on the form. As a consequence, only patients who had an ultrasound performed completed the second part of the questionnaire.

Design

The questionnaire was designed in conjunction with a psychologist who had a special interest in oncology. The original questionnaire was piloted on 20 patients attending the symptomatic breast clinic. This resulted in revision of the wording and layout of the original questionnaires. The final questionnaire consisted of two A4 sheets with text on one side of each sheet only. The questionnaire collected information such as:

- age
- occupation
- history of prior attendance at the symptomatic breast clinic
- primary referrer
- perceived qualification of the radiologist
- ranking of breast care team members in order of perceived importance
- role of the radiologist in their care
- anxiety.

In the assessment of levels of anxiety, we used a visual analogue scale (VAS). This is a widely used and proven method of measuring pain and fear/anxiety [4]. There was space provided for free text, allowing patients the option of specifying the cause of their anxiety both pre and post consultation with the radiologist.

When asking patients to rank members of the breast care team in order of perceived importance, the members of the team cited included the breast surgeon, breast care nurse, radiologist, physiotherapist, pathologist, oncologist and radiotherapist. The radiographer was not included in this list of health professionals. A value of 1 indicated highest importance and 7 indicated lowest importance.

When investigating the perceived qualifications of the radiologist, the options provided were "Medical Radiologist's", "Nursing Qualifications", "Radiography" and "Don't Know". A free text option was provided only to assess patients' knowledge of the job of the radiologist.

For the question "Does the radiologist play a role in your care?" a yes/no answer was provided. If the patient answered "yes", a free text field could then be selected to specify what they deemed this role to be.

Statistical methods

Patient responses were converted into and summarised as percentages. Paired *t*-tests were used to investigate for changes in parameters, including:

- levels of patient anxiety pre and post consultation
- ranking of members of the breast care team in order of perceived importance pre and post consultation.

Results

Patient population

306 female patients were recruited and completed a questionnaire at the time of consultation with the breast surgeon. A second identical questionnaire after breast ultrasound and further imaging was also completed. The majority of patients recruited (53%) were in the age range 20–40 years, 38% were aged 40–60 years, 3% were aged <20 years and 6% were aged >60 years. 82% of patients had no history of attendance at the clinic. The vast majority of patients (95%) had been referred by their general practitioner and most of the patients enrolled in the study were from lower socioeconomic groups (Figure 1).

Question 1a: "What qualification does the radiologist hold?"

76% of patients believed that radiologists held radiography degrees, while just 14% of responders knew that

Figure 1. Spectrum of socioeconomic groups enrolled in the study. Patients with the highest socioeconomic status were classified as Group A; those with the lowest were classified as Group E.

radiologists were medically qualified doctors. 1% of patients thought that radiologists held a nursing degree, while 9% of patients did not know what qualification a radiologist holds (Figure 2).

When correlating those patients who correctly identified that radiologists were medically qualified doctors with their socioeconomic grouping, we found that those who responded correctly were predominantly from higher socioeconomic groups (Figure 3).

Question 1b: "What is the job of the radiologist?"

The most common responses to this question were:

- to take X-rays
- perform scans
- mammography
- do scans and report back to the doctor.

Almost all of the responses, therefore, were tasks that are traditionally performed by radiographers. Only 20% of the 306 patients knew that radiologists interpreted scans. 5 of these 306 patients believed that the purpose of the radiologist was to administer radiotherapy or to treat cancer with X-rays. A subanalysis was performed to determine whether the possession of a paramedical qualification (nursing, speech therapy, physiotherapy) correlated with a correct understanding of the qualifications and roles of a radiologist. The results found that possession of such a qualification did not guarantee correct identification of the qualification of a radiologist. For example, 65% of the respondents who were nurses thought that radiologists held a radiography degree, while only 35% of them knew that radiologists were medically qualified.

Question 2: "Rank members of the breast care team in order of importance"

Before the radiology consultation, the breast surgeon was ranked as the most important member of the breast care team and the physiotherapist was ranked as the least important. None of the results demonstrated a statistically significant change post consultation, as defined by a p -value of <0.05 . The change in the mean

Figure 2. Responses to the question "What qualification does a radiologist hold?"

Figure 3. Correlation of patients who knew that radiologists were medically qualified doctors with socioeconomic grouping. Patients with the highest socioeconomic status were classified as Group A; those with the lowest were classified as Group E.

ranking of the breast care nurse (from 3.5741 to 4.000) approached significance, with a p -value of 0.054. This result suggests that at the end of a lengthy attendance at a symptomatic breast clinic the only potentially significant change in knowledge was a decrease in the perceived importance of the breast nurse.

Question 3: "Does the radiologist play a role in your care?"

>60% of patients responded "yes" to the question "Does the radiologist play a role in your care?"; <10% responded negatively and almost 30% did not know. When asked to specify what they thought this role was, the most common responses included:

- "decide nature of growth/decide if lump is serious"
- "find the abnormality to assist the doctor"
- "suggest further investigations"
- "stage disease"
- "ask if you have allergies before the scan"
- "decide if radiotherapy is needed/dose of radiotherapy".

Following direct interaction with the breast radiologist, 33% changed their answer to this question. Of the 10 patients in this group who originally replied "don't know", 9 changed their answer to "yes" and 1 changed it to "no". In the group of four patients who initially responded "no", three changed their answer to "yes" and one to "don't know".

Question 4: "Rate your level of anxiety and give the reason for it"

The mean level of anxiety was lower post consultation with the radiologist, with a value of 2.39 compared with 4.60 before consultation. This change achieved statistical significance, with a p -value of <0.05 . As already stated, a VAS was used to help patients quantify subjective feelings of anxiety pre and post consultation with the radiologist. The VAS consisted of a 10-point scale. At the ends of the scale, extreme limits of patients' subjective

responses were labelled. On the very left of the scale, for example, we labelled "no distress", and at the very right we labelled "extreme distress". Therefore, if the patient labelled their distress/anxiety level as 5, this was taken as moderate distress.

Study participants were also asked to give the principal cause for their anxiety. 14% of patients cited fear of the unknown as the cause of their anxiety, while 33% reported a fear of cancer or worry about the nature of their breast lump. Concern about the outcome of the visit accounted for 30% of patient anxiety and 7.5% of patients gave personal problems as their main source of stress. Factors related to the visit, such as fear of mammography, needles and the hospital environment itself, and the time spent waiting for the hospital appointment accounted for 15% of reported anxiety.

Discussion

The modern radiologist has a plethora of roles and responsibilities. Radiology is constantly evolving as a speciality and with that the roles of radiologists are expanding. As well as interpreting complex imaging studies and performing interventional procedures, the radiologist now must liaise with clinical colleagues and actively participate in patient care and decision making [4, 5].

Despite the crucial role played by radiologists in healthcare, only 14% of patients in our study knew that radiologists were medically qualified doctors. This finding is at odds with the results of a study carried out by Grant et al [6], who found that the majority of their respondents (82%) could identify that radiologists were medically qualified. 54% of their study participants related the length of time spent training as a radiologist to the complexity of the role of the radiologist. While Grant et al did not correlate their findings with the socioeconomic make up of the cohort of patients in their study, the discrepancy between our findings and theirs may in part be explained by the fact that the majority of our patients came from lower socioeconomic groups.

When patients were asked what they felt the job of the radiologist was, there appeared to be confusion, with responses showing a mixture of roles performed by radiologists, radiographers and even radiotherapists. This finding is in line with results from the aforementioned study by Grant et al [6]. In their study, 53% of participants thought that radiologists performed their examination. There is clearly confusion amongst patients between a radiologist, radiographer and radiotherapist. This is not helped by the fact that the nomenclature is so similar. In our case, it may be confounded by the fact that radiographers and radiologists may perform ultrasound scans on patients in the breast clinic.

It was surprising that possession of a paramedical degree did not guarantee correct identification of the qualifications of a radiologist. The fact that radiologists are less visible in the clinical environment may account for the discrepancy. In this era of teleradiology and PACS (picture archiving and communication systems), radiologists are undoubtedly losing opportunities for contact with our colleagues in all ancillary disciplines [7]. The popular media portrayal of radiologists is also a

contributing factor to our apparent "invisibility" in the clinical setting. Time and again the principal focus is on physicians and surgeons, even showing them performing and interpreting scans without recourse to radiologists or even radiographers.

Breast radiologists generally work as part of a multidisciplinary team. The value of a multidisciplinary approach in achieving excellent patient outcomes is well established. In the UK, the publication of the report by Calman and Hine [8] led to many organisations adopting the multidisciplinary approach, with the ultimate aim of improving patient care [9]. The multidisciplinary ethos is one of team work, communication, respect for all team members and equal value placed on the contribution of all team members [10]. Central to the success of the multidisciplinary model is that each team member understands not only the contribution made by other team members but also their practice [11]. Our study supports the need for increased education of our paramedical colleagues regarding the roles and responsibilities of radiologists. These colleagues are often the members of the healthcare team who explain to patients the need for imaging investigations and what they entail. Improved education would reduce confusion, heighten awareness of the valuable role we play, and allow for successful multidisciplinary teamwork and improved patient care [9].

When asked if the radiologist played a role in their care, the majority of patients (>60%) responded positively. This result improved further, with patients who were unsure or responding negatively prior to meeting the radiologist changing their answer post consultation. This is better than the results obtained by Grant et al [6], who found that only 39% of patients asked agreed with the importance of radiologists in patient care. The fact that almost all patients had a face-to-face interaction with the consultant radiologist in the symptomatic breast clinic may account for this result.

In terms of patient anxiety, our study demonstrated a statistically significant fall in patient levels of anxiety post consultation. Fear of cancer and fear of the outcome of the consultation, which could be construed as the same entity, contributed to over 60% of the causes of anxiety cited. Madden et al [12] had a similar finding in their evaluation of females' worries attending a breast clinic. They found that when females were asked to select their dominant worry, 55% chose outcome as their principal source of anxiety. This is hardly surprising, given that breast cancer affects approximately one in nine females in the UK and Ireland. The second highest cause of anxiety in our patient group was related to procedural factors, such as fear of needles.

It is interesting that our results as to the causes of patient anxiety correlate with Weinman and Johnston [13], who defined two cognitive aspects of stress associated with medical procedures. These aspects are procedural stress and outcome stress. Procedural stress is self-explanatory, while outcome stress refers to the results of the procedure or the effects of the diagnosis. A factor to consider is that 82% of our enrolled patients had no prior history of attendance at the clinic. A previous study looking at patient levels of anxiety and pain perception found that those patients who had previous experience of a similar procedure displayed a better

understanding of the procedure and anticipated less pain [14].

The statistically significant fall in anxiety as seen in our patient group may, in part, have been influenced by the fact that most of our patients were first-time attendees. This new understanding should prompt members of the breast care team to spend more time with patients explaining what is involved in their journey through the symptomatic breast clinic.

Patients undergoing medical investigations often imagine the potential outcome to be far worse than reality. As soon as the test is performed, there is anxiety about the outcome until the results are delivered [15]. In our department, almost all patients are told if their examination is normal or if further tests are required, immediately after completion of imaging. By explaining the outcome immediately to the patient you remove the second aspect of cognitive stress; that is, outcome stress as outlined above [13]. Our practice may explain the effect that the interaction with the breast radiologist had on reducing patient anxiety levels resulting in a reduction in both procedural and outcome stress regardless of the resulting diagnosis.

In the context of reducing patient anxiety, our study shows the significant value of direct contact between the radiologist and the patient. Far from simply facilitating and interpreting imaging procedures, the breast radiologist has a vital role to play in counselling patients regarding their results. For patients receiving a new diagnosis of breast cancer, the breast radiologist is uniquely positioned to provide the patient with an outline of any further procedures and investigations that will be required, helping to alleviate the outcome portion of cognitive stress.

A limitation of this study may have been the number of questions on the questionnaire; however, we noted a poor response rate to the pilot questionnaire, so subsequent drafts were shorter. This limited us as to the number of questions we could pose and the wording of the questions.

We did not record the numbers of patients who declined to participate in the study. Patients who attended the breast radiology department and received bad news often did not complete the second part of the questionnaire. Therefore, the true response rate is not known and this would also have introduced bias in calculations of parameters such as anxiety.

Because the questionnaires were not identifiable to specific patients, it was not possible to perform a subgroup analysis on the data from patients who were told that their imaging was normal compared with those requiring further investigations, including biopsy. The interaction with the radiologist would probably have had a lesser effect on the anxiety levels of the latter than on those attendees who had normal imaging studies.

In classifying patients according to socioeconomic group, housewives were classed as Group E, *i.e.* as belonging to a lower socioeconomic group, in spite of their education level or the potential occupation of their husbands. This may have led to inaccuracy when analysing data relating to socioeconomic groups.

Numerous studies have demonstrated increased anxiety in females with a family history of breast cancer [16, 17]. Some studies have also shown that patients with a

lower level of education report more breast-cancer-specific distress [18]. These parameters, however, were not examined in our study.

Conclusion

Our results have shown that there is a lack of awareness amongst patients and amongst our colleagues in paramedical disciplines regarding the roles and responsibilities of the modern radiologist. Despite this, we have demonstrated that radiologists have a significant role to play in reassuring patients and alleviating anxiety. The direct interaction of the patient with the radiologist at the time of breast ultrasound is crucial in educating patients as to the importance of the role of diagnostic radiologists. The findings of this study could easily be applied to other areas of radiology using the multidisciplinary breast model. In these times of economic uncertainty, cutbacks and inevitable healthcare reform, it is vital that we increase awareness of our specialty.

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