Laboratory Test Costs: Attitudes and Awareness among Staff in a Regional Hospital

Abstract:

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There continues to be an unrelenting rise in the volumes of laboratory tests ordered in medicine, which is both expensive and has the potential for over-investigation. We performed a quantitative, observational, cross-sectional study of staff with the authority to initiate a laboratory test, using a voluntary, anonymous questionnaire. Our aim was to assess the awareness of and attitudes towards laboratory test costs. 226 surveys were completed over 2 weeks in June, 2012. Most numerous respondents were staff nurses 125 (55.3%) followed by senior house officers (SHOs) 26 (11.5%) and clinical nurse managers/specialists (CNMs and CNSs) 23 (10.2%). The majority of staff, 191 (85.6%), felt unaware of the cost of laboratory tests, which they ordered. For non-urgent tests, the majority of respondents, 136 (61.8%) felt cost was either quite of very important. For urgent tests, the majority of respondents, 188 (84.6%) felt cost was of minor or of no importance. Doctors felt more aware of costs than nurses (26.9% vs. 9.3%) and doctors test cost estimates were correct more often than nurses (33% vs. 21%). The results indicate poor awareness of laboratory test cost amongst doctors and nurses. Given the expenditure incurred by a rise in the volume of tests and the potential for over-investigation for patients, strategies for improving the awareness of and attitudes towards laboratory tests need to be developed.

Introduction

Laboratory testing, as part of overall hospital budgets has been on an unrelenting rise for decades, relative to patient visits. Diagnostic tests represent 3% of annual cost of health care worldwide. Doctors control as much as 80% of laboratory costs through ordering. Reasons for overutilization have been much studied with numerous reasons such as defensive testing, fear or uncertainty, lack of experience, inadequate educational feedback, the use of clinical protocols and guidelines, routine clinical practice and clinicians unawareness about the cost of examinations. Independent factors for over utilization of tests were patient age >65, hospitalisation beyond 7 days and increased case difficulty. A previous small study of doctors in Ireland showed less than a quarter could accurately estimate the cost of laboratory tests. In times of limited resources for health care, it is imperative to evaluate overutilization of laboratory tests and in turn provide cost effective practice and quality care to our patients.

Methods

We set out assessing the awareness of and attitudes towards laboratory test costs among staff in Sligo Regional Hospital (SRH) in June 2012. An 8-question survey was designed, piloted and made available in all clinical and non-clinical areas of the hospital for a two-week period. The survey and the questions asked are shown in Figure 1. Inclusion criteria for participation were those staff with authority to order a laboratory test in the hospital. Staff not authorised to instigate tests were excluded. Emails and verbal ward reminders made staff aware of the survey. Questionnaires were voluntary, confidential and anonymous.

Question 7 asked respondents to estimate the cost of laboratory tests. This cost was for routine daytime batched tests. This included scientific staff, lab clerical staff, portering, tubes, forms, water purification and reagents.

Estimation was deemed correct if the quality control band where the actual cost lay, was selected. If the option(s) above or below the correct band were selected, this was deemed to be an over or under estimate, respectively. Respondents deposited completed questionnaires in secure collection boxes, available throughout the hospital. Results were collated on Microsoft Excel and analysed using SPSS (v15.0). Sligo Regional Hospital Research Ethics Committee granted ethical approval.

Results

Respondent Demographics

226 surveys were completed and collected over 2 weeks in June, 2012. Staff nurses were the most numerous respondents 125 (55.3%) followed by senior house officers (SHOs) 26 (11.5%), clinical nurse managers/specialists (CNMs and CNSs) 23 (10.2%), registrars 15 (6.6%), consultants 14 (6.2%), student nurses 12 (5.3%), interns 7 (3.1%) and specialist registrar (SpR) 3 (1.3%). 6 missing values.

Frequency of Laboratory Ordering

6 interns (85.7%) and 17 SHOs (65.4%) ordered >6 tests per day. These two roles were the most numerous for large ordering volumes. 11 student nurses (91.7%), 19 CNM/CNS (82.6%), 100 staff nurses (81.3%), 12 registrars (80%), 8 consultants (57.1%) and 1 SpR (50%) ordered >6 tests per day. These roles were the most numerous for low ordering volumes.

Attitudes towards cost of non-urgent laboratory tests

Those respondents who, in the majority, felt non-urgent test cost were of minor or no importance were 7 student nurses (63.6%) and 4 interns (57.1%). Those respondents who, in the majority, felt non-urgent test cost were quite or very important were 25 SpRs (100%), 12 registrars (85.7%), 11 consultants (78.5%), 15 CNM/CNSs (65.2%), 16 SHOs (61.5%) and 73 staff nurses (59.3%). 6 missing values.

Attitudes towards cost of urgent laboratory tests

The majority of every group of respondents felt cost of urgent tests was of minor or no importance, 12 student nurses (100%), 26 SHOs (100%), 7 interns (100%), 21 CNM/CNSs (91.3%), 100 staff nurses (81.3%), 11 registrars (73.3%), 10 consultants (71.4%) and 1 SpR (50%). 4 missing values.

Awareness of laboratory cost

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The majority in each role category, except interns, felt unaware of the costs of the tests they ordered. 12 student nurses (100%), 23 registered nurses (100%), 114 staff nurses (91.2%), 22 SHOs (84.6%), 19 CNM/CNS (82.6%), 12 registrars (80%) and 7 consultants (53.8%) felt unaware of the costs of tests generally. When grouped, 145 (90.6%) nurses compared with 46 doctors (73%) felt unaware of cost.

Estimation of laboratory cost

In total, there were 4025 estimations of cost, spread over 19 completed surveys. For some of these observations, some interventions show promise. Firstly, informing those who order of the actual cost in the highest cost range (blood culture, group and screen, Vitamin D, Vitamin B12 folate and Thyroid function tests). Over the 19 tests, those in senior roles (consultant, CNM/CNS, SPs, registrars, n=54) correctly estimated cost 25.4% (range 9.3% - 42.6%). This was very similar to more junior grades (staff nurses, SHOs, intern and student nurses) who correctly estimated cost 23.4% (range 9.3% - 42.6%). Overall, more senior grades felt there was more cost associated with the test and would therefore be less likely to order via random chance i.e. 25% correct. The SRH laboratory budget is 12 million, approximately 10% of the total hospital budget. Feedback alone, therefore could not be cost effective.

An increasing wealth of medical literature has highlighted the recent trend of over-diagnosis, over-investigation and over-treatment of our patients. Excessive laboratory testing is one element of this process. It can only stand to protect patients that appropriate utilisation of laboratory testing be encouraged.

Much research has centered on ways to improve appropriate utilisation of laboratory testing. On the whole, results have been varied and positive effects of interventions tend to wane over time. While the Hawthorne effect may account for some of these observations, some interventions show promise. Firstly, informing those who order of the actual cost can have the effect of improving appropriate utilisation. A study of a paediatric emergency department demonstrated evidence that by displaying price information to those ordering, laboratory utilisation was reduced for the period of observation. More senior doctors showed a smaller decrease in their ordering. The effect waned after the intervention perhaps emphasising the need for reinforcement. Patient outcomes and satisfaction were not affected by the intervention. Secondly, providing feedback has shown promise in improving over-utilisation of laboratory costs.

One small study of 56 doctors showed that providing a manual on tests and feedback, was superior to control (feedback alone). The small benefit at the expense of additional cost and for improving display of results as tools for cost effective medicine. Feedback provided by laboratory staff to high volume ordering physicians produced a significant 8% reduction in laboratory test orders. This study was community based but could work easily in a hospital environment. Another large Australian study found education feedback reduced avoidable tests being ordered but this effect waned after the intervention was completed. Feedback could take the form of senior chart review and laboratory staff feedback, if reinforced, are likely to produce positive sustained effects. Price information has a transient beneficial effect. However, one large study showed that implementing an intervention involving posters, pocket cards, mentorship of juniors, unbundling of tests and feedback alone was preferable from a cost point of view. While the Hawthorne effect may account for some of these observations, some interventions show promise. Firstly, informing those who order of the actual cost can have the effect of improving appropriate utilisation. A study of a paediatric emergency department demonstrated evidence that by displaying price information to those ordering, laboratory utilisation was reduced for the period of observation. More senior doctors showed a smaller decrease in their ordering. The effect waned after the intervention perhaps emphasising the need for reinforcement. Patient outcomes and satisfaction were not affected by the intervention. Secondly, providing feedback has shown promise in improving over-utilisation of laboratory costs.

Thirdly, some administrative interventions have an immediate effect on reducing over-utilisation. An Israeli uncontrolled administrative intervention reduced availability of emergency tests and curtailed repeat testing for 48 hours, as part of policy of laboratory cost control and a key part of the intervention. In our hospital, on-call and emergency testing have been curtailed for some time. There is scope for the introduction of minimum intervals between repeat tests. This has been studied and showed that automated test rejection based on predefined limits for repeat ordering, had a beneficial effect on physicians ordering behaviour and contributed towards health care savings. Finally, multifaceted interventions for promoting efficient laboratory use have been studied. An intensive multifaceted, hospital-based intervention in the Netherlands produced a 13% reduction in total diagnostic costs. The intervention involved posters, pocket cards, mentorship of juniors, un-bundling of tests and increased protocol adherence. However, a 2004 Dutch randomized control study showed that implementing an intervention involving posters, pocket cards, mentorship of juniors, un-bundling of tests and feedback alone was preferable from a cost point of view. While the Hawthorne effect may account for some of these observations, some interventions show promise. Firstly, informing those who order of the actual cost can have the effect of improving appropriate utilisation. A study of a paediatric emergency department demonstrated evidence that by displaying price information to those ordering, laboratory utilisation was reduced for the period of observation. More senior doctors showed a smaller decrease in their ordering. The effect waned after the intervention perhaps emphasising the need for reinforcement. Patient outcomes and satisfaction were not affected by the intervention. Secondly, providing feedback has shown promise in improving over-utilisation of laboratory costs.

In conclusion, our study is, to our knowledge, the first to assess the awareness and attitudes towards laboratory test costs among Irish healthcare professionals. Among the staff, we demonstrated a low awareness of costs, a propensity to underestimate costs and a reduced cost sensitivity in urgent testing. There are many evidence-based approaches that could be implemented to reduce laboratory over-utilisation. Price information has a transient impact. Further studies are required to determine if administrative interventions, such as multifaceted interventions, would be beneficial. We did not investigate GP's attitudes and knowledge of laboratory costs, but this is an area, which we feel also merits further study.

References
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