DECISION MAKING BY COMMUNITY PHARMACISTS WHEN MAKING AN OVER-THE-COUNTER DIAGNOSIS IN RESPONSE TO A DERMATOLOGICAL PRESENTATION

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ABSTRACT

BACKGROUND: Healthcare policy in many developed countries now promotes the concept of patient self-care, which has resulted in the expansion of the community pharmacists’ role in the management of minor illness. Pharmacists are now custodians of potent medicines to treat a growing list of medical conditions. However little research has evaluated the way in which pharmacists arrive at a diagnosis.

OBJECTIVE: To explore the ways in which community pharmacists make a diagnosis.

METHODS: Ten community pharmacists were asked to ‘think-aloud’ their reasoning as they interacted with a researcher posing as a patient with a skin rash. Pharmacists were recruited from the West Midlands region of England. Each interview was transcribed verbatim and analyzed in iterative cycles allowing major themes to be developed.

RESULTS: Three pharmacists offered a diagnosis of ‘allergy’; one for eczema; one for allergy/cellulitis and the remaining five pharmacists were unsure or offered no diagnosis. All offered treatment that provided symptomatic relief of itch. Transcript analysis revealed two major components to patient consultations: establishing a diagnosis and therapeutic management planning. In establishing a diagnosis three distinct themes emerged: questioning strategy; question framing; and underpinning knowledge.

CONCLUSION: Pharmacists rarely exhibited medical decision making techniques when establishing a differential diagnosis, and diagnostic performance was poor.

Key words: community pharmacy; decision making; diagnosis.

INTRODUCTION

Over the last 15 years healthcare policy in developed countries has placed greater emphasis on empowering patients to exercise self-care, especially for conditions deemed minor and self-limiting. In the UK, the government agenda for modernizing the National Health Service (NHS) was spelt out in its White Paper, The NHS Plan. Within this document the government made its intention clear to make self-care an important part of NHS healthcare. Since that time the UK government has published numerous papers detailing how maximizing self-care can be achieved.
An important element of self-care is the access the public has to medicines. Current UK health policy, in common with that of other countries, is to make medicinal products more freely available to patients and the general public. To date, over 90 prescription medicines have been made available as non-prescription medicines since the first UK switch in 1983.

Over this time pharmacy-specific research has focused on what motivates patients to exercise self-care, the acceptance of other healthcare professionals toward greater availability of medicines for non-prescription sale/supply and auditing pharmacist advice. However, arguably the most important role of pharmacists in facilitating patient self-care, that of making a diagnosis, has been largely neglected. A small number of studies have assessed what questions pharmacists ask and actions taken when dealing with standardized patient scenarios, but these studies did not address the clinical decisions taken by pharmacists prior to making their recommendations.

A recent small study by Iqbal et al attempted to look at how pharmacists make a diagnosis. This study found pharmacists relied heavily on protocol-driven questioning that, in the context of the scenario (in that case headache), led to incorrect diagnoses being reached.

The UK consumer organization ‘Which?’ has frequently highlighted deficiencies in the diagnostic ability of pharmacists when assessed using mystery shoppers. As pharmacists are custodians of an ever-increasing arsenal of medicines to treat a growing number of conditions their role as first-line healthcare professionals is taking on greater significance, which in turn may have implications on patient safety if pharmacists are poor diagnosticians.

**Use of a Dermatological Presentation**

Skin conditions are common and are estimated to affect up to a third of the population at some time during their lives. Patients exercise high levels of self-care in these conditions, exemplified in that almost 20% of UK OTC retail sales are for skin products. A recent national survey of pharmacists also showed that dermatitis/dry skin, thrush and allergic rashes were the commonest skin conditions for which patients sought advice.

This study therefore chose a presentation of urticaria to investigate community pharmacists’ clinical decision making.

**Models of Medical Clinical Decision Making**

The process by which medical practitioners make clinical decisions (and thus a diagnosis) has been subject to much debate and research. What is clear is that data collection is sequential yet selective, where inferences are drawn about the presenting signs and symptoms experienced by the patient. One theory describing this process is the hypothetico-deductive model. This approach involves recognition of ‘cues’ or ‘cue acquisition’, generation of hypotheses, interpretation of cues and then hypothesis evaluation. Cues can vary from patient observation (e.g. their age or a physical sign such as a person holding their back) through to information gained from the patient via questioning or by performing examinations or tests. Early in a clinical encounter, the practitioner will generate a limited number of hypotheses that guide them in further data collection. Each hypothesis can be used to predict what
additional findings ought to be present if it were to be true and further enquiry is a guided search for these findings; hence the method is ‘hypothetico-deductive’. This deductive framework is therefore a methodical approach to decision making, and can be used by experienced and novice practitioners alike, although the hypothetico-deductive model does not adequately represent the whole process of clinical reasoning. For example, ‘expert’ practitioners when presented with familiar situations tend not use hypothesis testing. In such cases, ‘experts’ employ reasoning based on experience; comparing new cases to previous cases that were similar, a concept known as pattern recognition. Thus making a diagnosis appears to be a combination of hypothesis generation and pattern recognition and has been described as the ‘cognitive continuum’ theory.

This exploratory study attempted to better understand the process of diagnostic clinical decision-making by pharmacists when confronted with a dermatological presentation (urticaria) and to determine if established models of clinical decision making were used.

**MATERIALS AND METHODS**

Semi-structured face-to-face interviews were conducted with 10 pharmacists working from pharmacies in the West Midlands, England. Convenience sampling was used to recruit pharmacists. The think-aloud technique was used to explore the cognitive decision-making processes used by community pharmacists when making a diagnosis in response to a ‘patient’ request. This method is often used to describe the sequence of thoughts behind decision-making by asking participants to say their thoughts whilst performing a task (responding to a patient scenario).

A scenario was devised where by a patient (in this instance the interviewer) requested advice from the pharmacist to treat a skin rash. Standardized replies to pharmacist questions were constructed to ensure the same response was given during each think-aloud session with the pharmacist. The scenario was constructed with reference to UK guidelines and standard pharmacy reference sources. A panel of 3 experienced pharmacists was selected to review the case to ensure the standardized replies were relevant and appropriate. The scenario was designed to represent urticaria on the right forearm. Given that the presentation was for a rash, if the pharmacist requested to see the rash, a photograph was shown by Jignaben Patel (JP).

To ensure the researcher (JP) performed consistently and was able to use the think-aloud technique, the scenario was role-played with members of academic pharmacist staff before data collection commenced.

Prior to the interview, assurances were given to participants over anonymity and confidentiality. Interviews were performed by JP at each pharmacist’s place of work. On the day of the interview participants were reminded of the purpose of the study and had the opportunity to ask questions before giving written consent. Interviews took place in February 2013. Interviews were audio recorded and transcribed verbatim. Nvivo software (QSR International Pty Ltd, UK) was used to manage the data and content analysis was used to identify any emergent themes; these were validated for context and understanding by PR. The interviewer (JP) had no relationship to any of the pharmacies or staff where interviews were conducted.
This study was approved by the Behavioral Sciences Ethics Committee in the School of Applied Sciences, University of Wolverhampton.

RESULTS

A summary of the interviewees, along with information on the number of questions asked, their diagnosis and course of action is shown in Table 1. There was considerable variation in the number of questions asked by the pharmacists (range 5 – 27 questions).

Table 1 Demographics

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age</th>
<th>Questions asked in establishing a diagnosis</th>
<th>Diagnosis</th>
<th>Action taken</th>
<th>Conditional doctor referral offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>26</td>
<td>13 Suspected allergy</td>
<td>Oral Antihistamine (chlorphenamine) and/or hydrocortisone recommended</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>45</td>
<td>8 'contact irritation'</td>
<td>Oral Antihistamine recommended</td>
<td>Yes: no improvement in 4-5 days</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>26</td>
<td>13 No diagnosis offered</td>
<td>Oral Antihistamine recommended</td>
<td>Yes: no improvement in 3-4 days or rash worsens, spreads or person starts to feel unwell</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>27</td>
<td>11 Unsure</td>
<td>Oral Antihistamine recommended plus topical crotamiton</td>
<td>Yes: no improvement in 5-7 days or rash begins to spread</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>40</td>
<td>20 Suspected allergy</td>
<td>Oral antihistamine recommended</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>34</td>
<td>9 Unsure</td>
<td>Hydrocortisone recommended to treat itch</td>
<td>Yes: No timescale provided</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>28</td>
<td>5 Unsure</td>
<td>Oral antihistamine recommended</td>
<td>Yes: no improvement in 2 days</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
<td>19 Suspected allergy</td>
<td>Cool compress and oral antihistamine recommended</td>
<td>Yes: No improvement in 7 days or is rash worsens</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>25</td>
<td>12 Eczema</td>
<td>Oral antihistamine and hydrocortisone cream recommended</td>
<td>No: however recommended to return to pharmacy if no improvement in a few days</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>43</td>
<td>27 Allergy or cellulitis</td>
<td>Oral antihistamine recommended</td>
<td>Yes: No improvement in 7 days or if rash begins to weep or spread</td>
<td></td>
</tr>
</tbody>
</table>

All antihistamine recommendations were for ‘non-drowsy’ antihistamines, either loratadine or cetirizine, except for pharmacist one.
Three pharmacists offered a diagnosis of ‘allergy’; one for eczema; one for allergy/cellulitis and the remaining five pharmacists were unsure or offered no diagnosis, yet all offered treatment options that would provide symptomatic relief of itch. Seven provided a conditional referral to a medical practitioner, although the time frame to do so varied widely. Two of three pharmacists who did not provide a conditional referral diagnosed allergy as the cause of the rash.

Analysis of the interview transcripts showed two major components to the patient consultation; establishing a diagnosis through information gathering and therapeutic management planning.

Establishing a diagnosis

Three sub-themes were identified that contributed to pharmacists establishing a diagnosis: questioning strategy; question framing; and underpinning knowledge.

Questioning strategy

Every pharmacist asked to view the rash, and this occurred very early in the consultation, except in one case where inspection of the rash took place after multiple questions had been asked. All stated that a visual inspection helped them in the process to differentially diagnose the rash.

Establishing how long the rash had been present was also a question asked very early on in the consultation by all pharmacists; it was the first question asked by five of the ten pharmacists. The rationale for asking about duration of rash appeared not to be driven by establishing a diagnosis by eight of the pharmacists, but whether the rash was something they believed was in the scope of the pharmacist to manage. Typically pharmacists spoke about if the rash was ‘acute’ or been present for a ‘short period of time’ then this equated to ‘more likely to treat’ where as rashes that had been present for ‘longer’ periods of time or deemed ‘chronic’ in nature would need referral to a doctor.

Once an inspection had taken place and duration was established all pharmacists then asked further questions around the presentation of the rash. However, the types of questions asked and sequencing of questions varied greatly between pharmacists. Given that the rash had been observed (cue acquisition), most pharmacists’ questioning strategy did not appear to show any targeted questioning relating to the presentation of the rash with regard to diagnosis (ie. hypothesis generation and evaluation). During ‘think aloud’ conversations this method of diagnostic reasoning was very infrequently articulated. An exception was ‘pharmacist 1’, where discriminatory and confirmatory questions were asked that stemmed from inspection of the rash (e.g. asking about itching and blanching of the rash). Much more typically, the pharmacists’ justifications of questions asked after observing the rash appeared to have little relevance (e.g. wanting to know if the rash had spread ‘as this could suggest shingles’). Pharmacists, in common with asking about duration of rash, asked further questions to establish if the rash was outside their scope of practice. For example, eight pharmacists asked if the rash was elsewhere, with the rationale given that ‘spread’ was linked to either a ‘severe problem’ and would require ‘GP attention’.

Eight pharmacists took a medication history, with six stating it was for the purpose of eliminating the medicine as the causative agent, although only two pharmacists stated specific medicine classes that
were upper most in their thinking (anti-epileptics, methotrexate and antipsychotics). Four pharmacists explored past medical history with regard to rash presentation, although two asked in the context of treatment planning and not establishing a diagnosis.

**Question framing**

The majority of questions asked by all pharmacists were closed-type questions, requiring yes/no responses. Few open-ended questions were asked. In all consultations, pharmacists were found to ask more than one question at a time (double or triple barreled questions), for example:

‘Did you change your cream, or do anything unusual?’ (Pharmacists 6)

‘Has it got better, has it spread, has it got worse?’ (Pharmacist 9)

Pharmacists also, on occasion, asked leading questions, ‘and you haven’t tried anything?’, ‘so, its itchy and red?’ Only one pharmacist built in a summary at the end of information gathering to allow the patient to confirm facts. The majority of pharmacist consultations appeared to lack logical sequencing or purpose; five pharmacists asked more diagnostic questions after they had suggested treatment options to the patient.

**Underpinning knowledge**

Throughout the interviews pharmacists were encouraged to think aloud their reasoning in response to the scenario. This allowed some assessment to be made of the knowledge base they had regarding an allergy skin presentation. Gaps in knowledge, or poor knowledge were identified. This ranged from only one pharmacist enquiring about if the rash blanched on pressure to limited understanding on the differences of presentation between urticaria, fungal infection and dermatitis. For example, all ten pharmacists asked if the rash itched and all ten stated that itch was associated with allergy but they had poor knowledge of the differences in lesion type between urticaria, fungal infection and dermatitis. One pharmacist’s line of questioning centered on ruling out meningitis despite the presence of no symptoms associated with meningitis.

**DISCUSSION**

This study reveals that there is considerable variation in performance of community pharmacists in terms of determining a correct diagnosis. This finding was not unexpected given findings from other studies. The reason for variable performance is little researched, although studies have attempted to improve pharmacist performance through educational intervention, although with limited success. These studies lend support to the criticism leveled at pharmacists by consumer organizations.

The aim of this study was to try and ‘unpick’ how pharmacists go about the process of making a diagnosis, which might shed light on their performance. It can be seen from our findings that pharmacists (with one exception) displayed few characteristics of using medical decision-making models, i.e. the sequential and selective use of questions to confirm or rule out possible diagnoses. This was most evident in that, although all pharmacists viewed the rash (and most very early on in the
consultation), this did not shape subsequent questioning. If pharmacists were using clinical reasoning and cue interpretation then it would have been expected that questions following visual inspection would have been different than observed. We observed that questions following inspection of the rash were used not to establish a differential diagnosis, but to establish scope of practice and whether the rash was something requiring referral. This seemed to be based on trying to establish ‘severity’, often articulated as extent and duration of rash, which appeared to drive pharmacist questioning. Further evidence of pharmacists not using a clinical-decision making approach to diagnosis, was the necessity for half of the pharmacists to ask ‘diagnostic’ questions once a treatment plan had been formulated. This implies that questioning strategy was haphazard and constituted generating a collection of facts with no specific purpose in regard to diagnostic decision making.

It has been reported that the cognitive diagnostic processes needed for community pharmacists is routine and therefore easy\(^33\). Our data would not support this stance. This might be explained through lack of exposure to such presentations. In UK pharmacy practice it is considered good practice to refer patients to medical prescribers when clinical uncertainty exists, but it is rare that pharmacists receive feedback from prescribers. This effectively creates a ‘glass ceiling’ where pharmacists presented with similar presentations will adopt the same course of action; thus clinical experience does not translate to improved performance which is widely cited in medical literature as a step to becoming expert\(^33\).

Incomplete mastery of knowledge will also exacerbate clinical uncertainty. Our study showed that the knowledge base of pharmacists could be called in to question. We observed examples of pharmacists stating incorrect information regarding the presentation of various skin conditions. It is clear that if the pharmacists’ recall of disease presentation is flawed then this will lead to incorrect decision-making. Finally, pharmacists’ phrasing of questions during consultations also seemed to hinder data collection and synthesis. Questions tended to be closed, there were many instances of double-barrelled questions and at times leading questions were asked. This affected the quality of responses provided by JP to pharmacists, and ultimately influenced the data obtained and therefore their ability to assimilate this information.

In the UK, the aide-memoire known as WWHAM (Who is it for, What are the symptoms, How long have the symptoms been present, Any medication tried already, other Medication taken) is promoted (and taught at many Schools of Pharmacy). Pharmacists in this study did ask the WWHAM questions – although not always in strict order. Whilst the WWHAM approach to questioning promotes data collection it is not designed to establish the diagnosis of a problem and thus does not align to medical decision-making models. Given the findings from this study and the performance of pharmacists in other studies it seems the utility and value of advocating this approach needs to be questioned.

**Limitations**

The sample size in this study is small. Because of the small number of participants the findings do need to be viewed with caution and further larger studies are needed to test these findings; this work is on-going.
CONCLUSION

Pharmacists rarely exhibited characteristic patterns of medical decision making toward establishing a differential diagnosis and diagnostic performance was poor.

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REFERENCES


