Oral anticancer medicines in acute oncology; recognition by non-specialist clinicians and risk reduction measures

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ABSTRACT

Objective This study investigated the awareness of non-oncology specialist medical staff about commonly used oral anticancer medicines (OAMs).

Methods Interviews conducted with a range of non-oncology specialist doctors.

Results The recognition of OAMs was poor by all grades of doctors, with capecitabine being the only drug recognised by more than half the doctors (26 of 40; 65%). Consultant medical staff scored significantly better than most junior grades of staff.

Conclusions A barrier to safe patient care appears to be the initial identification of OAMs on acute admission. Once a drug had been identified as an OAM, doctors are aware that they should not prescribe it and should contact the acute oncology service for advice. A range of measures has been introduced to improve the identification of OAMs by doctors.

INTRODUCTION

The risks associated with the use of oral anticancer medicines (OAMs) were highlighted by the National Patient Safety Agency when they issued a rapid response report to staff involved in their prescribing, dispensing and administration.^{1, 2} The risks were noted to be increased where non-specialist practitioners prescribe, dispense or administer OAMs and bypass the normal safeguards used for injectable anticancer medicines.

There are several issues which can arise with oral medication to a greater extent than parenteral chemotherapy medication. These include:

1. The dose taken by the patient may differ from the intended dose, through non-adherence.
2. There is a risk that OAMs may get prescribed or dispensed outside the chemotherapy service.
3. Patients may be admitted to hospital during their cycle of chemotherapy and this is a point where risk may occur and these risks are greater when patients are admitted to non-cancer specialist wards.²

Airedale has a busy cancer outpatient department providing day-case chemotherapy treatments and, although there are no designated inpatient facilities for medical oncology patients, there is a well established acute oncology service in compliance with national standards.^{3, 4}

On medical and surgical wards, a patient's medical and drug history will be taken by a junior doctor who is unfamiliar with chemotherapy. This leads to a risk that an OAM will be transcribed onto the inpatient prescription chart when this may be inappropriate. Our previous publication

demonstrated that, while measures can be put in place to reduce the risk, these are not infallible.⁵

The aim of this study was to investigate the awareness of non-oncology specialist doctors about OAMs used in the Trust and find out whether these doctors are aware of the appropriate action to be taken in the event of a patient being admitted on one of these agents.

METHOD

Individual interviews were undertaken with medical staff over a 3-month period. No specific sampling method was used but a representative sample of clinicians was recruited from a range of adult medical specialties.

The interview was designed to test the doctor's ability to identify a range of OAMs from a list of drugs provided by the interviewer (figure 1). A scoring tool was devised in which one point was allocated for a correct identification of an OAM, and one point deducted for an incorrect answer and overall scores from the different grades of staff were compared for significance using an unpaired t test.

Doctors were given a list of potential adverse effects of chemotherapy and asked to identify those which might be experienced by a patient taking capecitabine (the most commonly used OAM within the Trust).

A scenario was provided in which doctors were asked to state the correct course of action to be taken in the event of a patient being admitted onto their ward while taking an OAM. Finally, the doctors were asked whether they felt that they were competent to manage patients admitted on OAMs on their ward, and to identify whether they would like to undertake training in this area.

RESULTS

Forty interviews were conducted over a 3-month period. Most were junior medical staff at FY1 level (18, 45%) or FY2 level (6, 15%). A number of more senior medical colleagues were also included; seven specialist trainee or registrars (18%) and nine Consultants (23%). This sample represented 66% of all doctors working in adult medical specialties with the Trust (40 interviews from a possible 60 medical staff).

Table 1 shows the five most commonly recognised OAMs and the number of doctors who correctly identified them.

Using the devised scoring system, the Consultants were the only group to obtain a positive score (+1.78), indicating that they identified

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Capecitabine
 Thalidomide
 Imatinib
 Hydroxycarbamide
 Erlotinib
 Gefitinib
 Vinorelbine
 Topotecan
 Herceptin
 Venlafaxine
 Rituximab
 Etanercept
 Filgrastim

Figure 1 List of medicines used to carry out interviews.

more OAMs correctly than incorrectly. Foundation-level doctors scored -2.25 which was significantly worse than the Consultant group ($p=0.03$).

Fifteen doctors (37.5%) correctly stated that neutropenia, thrombocytopenia, chest pain and palmar-plantar erythrodermia were all possible adverse effects of capecitabine. Twenty doctors (50%) knew some of the adverse effects of capecitabine and, of these, neutropenia was the most recognised, while only three (7.5%) recognised chest pain as a possible adverse effect.

Only 8 of the doctors (20%) felt that they were competent to manage patients taking oral chemotherapy on their wards, ranging from 4 out of 9 Consultants to just 2 out of 24 Foundation doctors.

Given a scenario in which a patient was admitted with severe diarrhoea and dehydration while taking capecitabine tablets, 31 doctors (77.5%) identified that the correct course of action would be to omit the capecitabine from the inpatient prescription chart and seek advice from the acute oncology service.

Nearly all doctors (39 of 40 interviewed) felt that education and training about the use and management of OAMs would be useful, and group tutorials was the preferred choice of educational method.

DISCUSSION

Hospitals which have a dedicated oncology ward benefit from it because the specialist medical team knows the history of patients and how to manage patients admitted presenting with adverse effects of chemotherapy. Acute oncology services have been introduced to ensure the safe treatment of the patients with cancer who are admitted to general medical and surgical wards;

however we still see cases where inappropriate decisions were made to continue OAMs which should have been stopped.⁵

The results of our current study showed that many OAMs were not well recognised by non-cancer specialist clinicians.

Capecitabine was recognised most frequently, with 65% of doctors able to identify it as such. Other oral chemotherapy drugs were less well recognised and this was as low as 10% in the case of topotecan. It is likely that this degree of recognition reflects the frequency of use of each agent. Using the devised scoring system the Consultants were significantly more likely to identify the drugs correctly than the lowest grades of medical staff. These results emphasise the value of experience in gaining knowledge about the use of drugs, as we might expect more recently qualified staff to be aware of drugs used in other specialist areas of medicine. However, most prescribing on the wards is carried out by the junior medical staff and these are the doctors who will make an *initial* decision on whether to continue an OAM in a patient who is admitted.

The doctors were generally able to pick out the more common adverse effects of OAMs, but few were able to identify less common effects, such as angina. This may have detrimental effects for patients if doctors are unable to recognise that symptoms may be chemotherapy related.

A minority of doctors felt that they were competent to manage OAMs in patients who were admitted to their wards. Even among the most senior medical staff this figure was less than half. These figures reinforce the need for an acute oncology service to manage these patients, but it still requires medical staff to recognise the need for referral to the service.

When given a scenario in which a patient on OAM was admitted, the majority of doctors correctly identified the appropriate course of action to take. This suggests that much of the problem lies with identification of a drug as an OAM and that once this has been done most doctors know the appropriate action to take.

There are no other published studies which have investigated the knowledge of non-oncology specialist doctors about chemotherapy medication and so we can draw no conclusions about whether the doctors interviewed in this study scored better or worse than their peers. The results were unsurprising as doctors receive very little information on the use of chemotherapy agents during their medical training and many will not gain much experience in oncology as they progress through their rotations. We expected that junior medical staff might have a better knowledge of current medications used in other specialties; however this did not prove to be the case which suggests that much of this knowledge is picked up through experience by the more senior medical staff.

A report published by the Academy of Medical Royal Colleges raised concerns about the prescribing and administration of cytotoxic drugs by Foundation-level doctors which supports our findings that there is a general lack of knowledge and awareness of these agents by non-specialist staff. The report described a key role for close monitoring of cytotoxic agents by clinical pharmacists, and an increased use of electronic prescribing systems.^{6,7} We have introduced a series of measures to help reduce the risk from inappropriate management of patients on OAMs who are admitted to the wards.

Education

Newly appointed Foundation doctors attend a tutorial which has medical, nursing and pharmacy inputs. This includes an introduction to OAMs and their safe use, how to manage

Table 1 The number of doctors correctly identifying specific OAMs

Drug	Number of doctors who correctly identified the drug as an OAM			
	Consultants (9)	ST/GPST (7)	FY1/FY2 (24)	Overall (40)
Capecitabine	7 (78%)	4 (57%)	15 (63%)	26 (65%)
Gefitinib	2 (22%)	1 (14%)	6 (25%)	9 (23%)
Erlotinib	2 (22%)	2 (29%)	4 (17%)	8 (20%)
Vinorelbine	1 (11%)	1 (14%)	4 (17%)	6 (15%)
Topotecan	1 (22%)	0 (0%)	3 (13%)	4 (10%)

FY1, foundation year 1; FY2, foundation year 2; GPST, general practice specialty trainee; OAMs, oral anticancer medicines; ST, specialty trainee.

patients admitted to the wards, and how to identify which drugs are classed as OAMs.

Resources

Wards display a poster describing the action to be taken in the event of a patient being admitted, and a list of OAMs used within the hospital. Doctors are given a pocket card which lists these agents. They are introduced to the slogan ‘if in doubt, leave the chemo out’, suggesting that it is better to omit a dose of OAM, while awaiting advice from the acute oncology team.

Alert stickers

We have developed a very simple red alert sticker which is attached to every box of OAM dispensed from the hospital pharmacy.⁵ This very obvious sticker means that junior medical staff looking through a patient’s medicines can easily identify if they are taking an OAM.

Education of patients

When patients are assessed by the specialist pharmacist in a pre-chemotherapy clinic, they are educated about their OAM and about the need to bring it into hospital if they are admitted.

Electronic prescribing

An electronic prescribing system has been implemented across the acute trust and this limits the prescribing of cytotoxic agents and provides robust warnings for monitoring of these agents where prescribing does take place.

CONCLUSION

The recognition of OAMs by non-oncology specialist doctors of all grades is poor, with capecitabine being the most widely recognised drug, and the only one tested where more than half of doctors recognised it. It is the junior doctors who clerk the patients on admission and who transcribe medication onto the

inpatient prescription chart and it is therefore *their* knowledge which will dictate whether the correct action is taken when patients are admitted on OAMs. Nearly all the doctors interviewed welcomed further training and therefore we have developed a range of initiatives designed to educate and support the medical staff. We have introduced resources to assist in the identification of oral chemotherapy drugs on non-specialist wards, and these include posters, pocket cards and red alert stickers.

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Contributors All listed authors made a significant contribution to the study, either through undertaking interviews (GJ and RD) or compiling and writing the report (CDB and SMC).

Competing interests None declared.

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