Medication Interruption in Surgical Patients

The abrupt discontinuation of medications can cause serious consequences because of the physiologic effects of drug withdrawal or the exacerbation of symptoms of the disease being treated.[1] Admission to hospital puts a patient at risk for such abrupt discontinuation because clinicians may be unaware of the patient's complete drug regimen or because interventions in the hospital may require temporary disruption of long-term therapy. In a recent study, approximately 5% of patients admitted for surgery suffered from postoperative complications directly related to the abrupt withdrawal of their regular medications.[2] In other studies, disruption of patients' drug therapy was due to withholding of medication for fasting purposes[3] or a failure of the admitting doctor to prescribe the medication.[4] Ignorance of prior drug therapy may frequently contribute to discontinuation of long-term therapy.

In British Columbia, a secure computer network (PharmaNet) links all community pharmacies throughout the province, giving care providers access to the complete prescription record of any patient. The complete patient information that is provided allows the clinician to properly adjust or monitor patients' medications throughout their care, including hospital stays.

We used PharmaNet to determine the number of patients undergoing general, orthopedic, vascular, or urologic surgery for whom necessary long-term therapies were inadvertently interrupted during the hospital stay and the proportion of those patients who suffered consequences from these interruptions. Data were collected retrospectively for surgical patients admitted to St Paul's Hospital, an acute care academic and research hospital, for a 6-month period starting in August 2001 and ending in February 2002. Patients were excluded if they were admitted for less than 24 h, were not residents of British Columbia, or were undergoing any type of surgery other than general, orthopedic, vascular, or urologic surgery.

Data collection focused on comparison of patients' medication therapy before admission (as recorded in PharmaNet) and the medications that were prescribed postoperatively in the hospital. Written consent was obtained to access the PharmaNet profiles.

A missing drug therapy was identified as being clinically important if it met all of 3 essential criteria and one or both of 2 additional criteria:

Essential criteria (all 3 required)

- The medication was being used before admission on a continuous basis, not on an "as necessary" basis.
- The patient had been receiving the medication for a period of greater than 2 weeks.[2]
- The medication was not being used to treat a surrogate marker in a chronic condition (e.g., cholesterol-lowering agents).

Additional criteria (either or both required)

- The medication was being used to treat a condition or to prevent symptoms associated with a condition that would not be relieved or cured by the operation.
- The medication had a documented withdrawal effect.

The impact of missing drug therapy was assessed by review of the patient's clinical record to determine if any subjective or objective evidence of drug withdrawal had been recorded. A clinically significant event related to missing therapy was defined as a return of signs and symptoms of the condition that was being treated by the missing medication or signs or symptoms of withdrawal from the missing medication sufficient to prompt treatment medications (usual or alternative) to be reinstated to control the event, where other reasons that might have been responsible for the event could be excluded.[2] If symptoms of withdrawal were similar to symptoms that might be expected following the surgical procedure, the time of onset and discontinuation of symptoms was evaluated to determine the likely cause. If the cause could not be confidently identified, it was assumed not to be from drug withdrawal.

Because of the retrospective nature of the evaluation, the investigators were limited in their detection of the consequences of any interruptions to the data that had been recorded by the patients' caregivers at the time of care.

Fifty patients who had undergone surgery during the 6-month period were identified as having medication interruption. Three were excluded: one was from a nursing home, another was from out of province,

Table 1. Quantification and Classification of Interrupted Long-Term Therapies

Therapeutic Classification	No. Missing
Antidepressants	8
Antidiabetics	1
Antidiarrheals	1
Antiepileptics	1
Antifungals	1
Antihypertensives	2
Benzodiazepines	4
Bronchodilator, inhaled	1
Digoxin	1
Diuretics	3
Gastric acid suppressants	2
Hormone replacement therapy	1
Laxatives	3
Nonsteroidal anti-inflammatory drugs	2
Potassium supplements	1
Sedatives	1
Steroid nasal sprays	4
Thyroid replacement	1
Topical creams (antibiotic, anti-inflammatory)	2

and for the third, the medical record could not be located for evaluation. Of the remaining 47 patients, 19 (40%) had undergone general surgery, 13 (28%) urologic surgery, 11 (23%) orthopedic surgery, and 4 (9%) vascular surgery. Twenty (43%) of the patients had experienced medication interruption. For these patients, there was a wide range in the number of medications (for a variety of indications; see Table 1) that were discontinued upon admission: 1 drug was missing for each of 9 patients, 2 drugs were missing for each of 4 patients, 3 drugs were missing for each of 5 patients, and 4 drugs were missing for each of 2 patients.

Three patients (6%) suffered clinically significant consequences as a result of discontinuation of prior medications. The first patient had been receiving temazepam 30 mg at bedtime. The first night after admission, the patient demonstrated aggressive behaviour for which lorazepam 2 mg was administered. The patient also suffered from chest pain that was relieved by nitroglycerin spray. The second patient had been receiving doxepin 125 mg once daily before being admitted for surgery. It was documented on 2 separate occasions that the patient was upset, was suffering from depression of mood, and was crying continuously. According to the study definition, these symptoms might have signalled the return of depression due to interruption of therapy. The third patient had been receiving docusate 200 mg once a day before being admitted for surgery. Three days after admission, constipation was documented in the patient's record. A glycerin suppository was given to relieve her discomfort.

Six percent of the patients admitted for surgery in this study experienced clinical consequences because long-term therapies were inadvertently discontinued. The study population was not large enough to determine the statistical significance of this number. However, this percentage would translate into a number needed to treat of 16. Thus, for every 16 patients, we might expect to find one patient suffering serious consequences because of missing therapies. And because one or more drugs was discontinued for 43% of the patients, we might expect that for every 2 patients whose medication history was examined, 1 would be found to be missing therapy while in hospital.

Our small sample size limited a thorough evaluation of the ages and types of surgical patients. In addition, the clinical implications of missing medications were very difficult to determine retrospectively. The diligence of other health care workers in recording possible signs and symptoms of withdrawal or reoccurrence of the original disease varied.

Undertaking a PharmaNet review for every patient under a pharmacist's care would be a daunting task because of the time required. However, given the potential for therapies to be missing and the possible rate of serious clinical consequences, this might be a worthwhile endeavour. Medication interruption is a drug-related problem that pharmacists can prevent. In British Columbia, resources such as PharmaNet can enable us to prevent this type of problem from occurring in our patients.

References

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