A Pilot Project Implementing Pharmaceutical Care and Continuity of Care in an Ambulatory HIV Clinic

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INTRODUCTION

The acquired immunodeficiency syndrome (AIDS) was originally characterized in Los Angeles, Calif., in 1981. By 1983, the etiologic agent of AIDS, the human immunodeficiency virus (HIV), had been identified.[1] In Canada, AIDS is defined by an HIV-positive test result and the onset of one or more specifically defined clinical diseases that indicate a weakened immune system.[2] As of December 31, 1997, 15 528 cases of AIDS had been reported in Canada.[3]

Although HIV infection is incurable, numerous medications are routinely used to reduce viral load and prevent or treat opportunistic complications. As HIV infection progresses from the asymptomatic stage to AIDS, the number of medications required increases.[4,5] Polypharmacy, in turn, increases the occurrence of drug-related problems (DRPs) such as noncompliance and drug interactions.[4-9] AIDS patients have a higher incidence of adverse reactions to some drugs than do healthy patients,[10] and drug allergies are common in this population. An estimated 29% to 65% of HIV-positive patients are allergic to trimethoprim-sulfamethoxazole, a preparation commonly used for the treatment of *Pneumocystis carinii* pneumonia.[11] One study in an ambulatory HIV/AIDS population showed that 70% of patients were taking at least 3 prescription medications, 80% experienced adverse effects from zidovudine, and 70% omitted doses.[6] The tendency for these patients to use alternative therapies, investigational drugs, nutritional supplements, recreational drugs, and over-the-counter medications in addition to prescription drugs may also increase the risk for adverse drug reactions and may affect the results of clinical drug trials.[4,12] Other problems in this population include sharing of medications and under-reporting of current medication usage to physicians.[4,6]

The general objectives in treating HIV infection are to prolong survival, prevent opportunistic infections, manage disease symptoms, and improve the patient's quality of life.[13] To accomplish these objectives, there is a need for pharmacists to communicate with patients to establish a complete medication history; identify adverse reactions, drug interactions, and compliance problems; work with patients and physicians to solve or prevent these problems; and make therapeutic recommendations when necessary. In essence, there is a need for pharmacists to provide pharmaceutical care to HIV-positive patients.

Over half of an HIV-positive outpatient population surveyed in 1992 indicated that their pharmacy service needs included confidential consultation with the pharmacist regarding drug information and information on nutritional supplements, vitamins, and unofficial medications. Seventy-five percent expressed a desire for written as well as verbal information.[14]

To meet the demands of this population, pharmacists have become involved in the treatment of HIV-positive patients in several clinical capacities.[15-18] The practice of pharmaceutical care in HIV-positive populations has emerged in hospital, community, and ambulatory clinic sites.[12] Some community pharmacists have created specialty practices in the area of HIV/AIDS,[19] and suggestions for serving HIV-positive patients in community pharmacies are available.[20,21]

Community and hospital pharmacists should work

together to bridge the gap in health care and to reduce DRPs and misunderstandings about patients' medications. Suggestions for improving continuity of care include counselling and giving the patient a list of current medications upon hospital discharge (done by the hospital pharmacist) and, for patients being admitted to hospital, providing a list of current medications beforehand (done by the community pharmacist).[22] Several continuity-of-care initiatives have been described recently.[12,23,24] HIV-positive and AIDS patients would benefit from continuity of care, as they often take multiple medications, are frequently admitted to hospital, and are usually under the care of several different specialists.

The Central Saskatchewan Immunodeficiency Clinic at the Royal University Hospital (RUH) in Saskatoon offers comprehensive care for most of the HIV-positive patients in the province. Approximately 60 to 80 HIV-positive and AIDS patients are currently seen in the clinic. Two or three half-day clinics are held weekly. Physicians specializing in infectious diseases assess the needs of the patients and manage HIV infection and related opportunistic diseases. The HIV nurse clinician provides direct care and offers education and support to patients and their significant others. The clinic also employs a research nurse to manage studies and a coordinator to establish and maintain standards of practice. A pharmacist from the RUH Outpatient Pharmacy is available to provide medication counselling to patients. However, limited resources have prevented the creation of a formalized pharmaceutical care service.

This paper describes a pilot project, the purpose of which was 2-fold: to provide pharmaceutical care to a subgroup of HIV-positive and AIDS patients registered in the Central Saskatchewan Immunodeficiency Clinic, and to facilitate continuity of care for these patients by promoting pharmacist-to-pharmacist communication between the outpatient clinic and community pharmacy practice sites.

METHODS

The pilot project was conducted at the Central Saskatchewan Immunodeficiency Clinic over a 7-week period. The patients came from various parts of the province and were seen by a single physician. All patients verbally consented to participate. All HIV-positive and AIDS patients who were receiving care at this clinic and who were not living in an institutional setting were eligible to participate. Those who could not be contacted by telephone or did not communicate in English were excluded.

The nurse clinician identified 15 to 20 potential participants for the pilot study approximately 2 weeks before the patients' scheduled visits and contacted them by telephone to ascertain their interest in participating. Selection of these patients by the nurse was a subjective process, based on the nurse's belief that the patient might benefit from pharmacy services. Patients referred by the nurse met at least one of the following criteria: (i) were experiencing medication-related problems at the time, (ii) were receiving a minimum of 3 medications, (iii) were noncompliant with medication regimens; (iv) had expressed an interest in pharmacy services; or (v) were new to the clinic. The nurse forwarded a list of potential participants to the pharmacy resident (C.M.B.). The pharmacy resident then contacted each patient by telephone about 1 week before the appointment to explain the project and obtain the patient's consent to participate.

In preparation for this project, the pharmacy resident completed a 1-month infectious diseases rotation, had a 1-day orientation in the HIV clinic, and undertook extensive self-study in the area of HIV/AIDS therapeutics. Afterwards, the resident gathered and modified several forms to facilitate provision of pharmaceutical care and continuity of care. One such form was the form for continuity of pharmaceutical care, which had been developed in consultation with retail pharmacists experienced in caring for HIV-positive patients (this form is available from the authors upon request).

Pharmaceutical care was provided according to previously described methods.[25,26] Information about patient characteristics, medical conditions, drug therapy, lifestyle, and socioeconomic status was obtained from the patients' medical records before the clinic appointments and from a 15- to 20-minute interview with the patients and their caregivers immediately before the physician saw the patients.

The pharmacy resident assessed the patients' records for DRPs, categorized the DRPs, and assigned each DRP a high (life-threatening), moderate (harmful to patient if not resolved), or low (not ideal, but not expected to be harmful) priority.[27] All DRPs were documented in the pharmacy care plan.

Realistic goals that could achieve definite medication-related outcomes were stated in the pharmacy care plan. Therapeutic alternatives were based on the most recent guidelines in the literature for medical care of HIV-positive and AIDS patients. The pharmacy resident discussed recommendations for optimizing drug therapy with the physician, the nurse, and the patient. Monitoring plans were designed to evaluate achievement

Table I. Type and Priority of Drug-Related Problems in 16 HIV-Positive Patients

Type of problem	Priority[a]			Subtotal (% of Total)	
	High	Moderate	Low		
Drug interaction	1	10	25	36	(41)
Adverse drug reaction	0	4	17	21	(24)
Drug not being received as prescribed	0	8	10	18	(20)
Supratherapeutic dose	0	3	0	3	(3)
Subtherapeutic dose	0	2	1	3	(3)
Failure to receive a drug that was required	0	2	1	3	(3)
Drug use without indication	0	1	0	1	(1)
Wrong drug	0	0	1	1	(1)
Other	0	0	2	2	(2)
Subtotal (% of Total)	**1 (1)**	**30 (34)**	**57 (65)**	**88**	**(100)[b]**

[a] Priority: high = life-threatening, moderate = harmful if not resolved, low = not ideal, but not expected to be harmful.[27]
[b] Percentages do not sum to 100 because of rounding.

of the goals and to detect any real and potential adverse effects. Finally, the pharmacy resident counselled the patients and provided drug information monographs and individualized computer-generated drug therapy schedules (HIV Therapy Scheduler, Version 1.0, Merck Frosst Canada Inc., Kirkland, Que.). Data were collected for each monitoring parameter, and, when necessary, patient follow-up by the resident, by telephone, was done 1 week after the initial appointment or at a future visit to the clinic. If further DRPs arose or initial ones had not yet been rectified, suggestions were made at that time for additional changes.

The acceptance of pharmacist recommendations was documented. Patients were assumed to have accepted recommendations if they communicated intent to follow the suggestions; if, during telephone follow-up, they stated that they had acted on the suggestions; or if community pharmacists were able to substantiate patients' claims.

For each patient, a summary of continuity of pharmaceutical care, which outlined demographic, socioeconomic, medical, medication, compliance, and DRP information, as well as history of present illness, was completed and mailed to the appropriate community pharmacy along with recent articles regarding HIV therapy. The pharmacy resident telephoned the community pharmacists to encourage their involvement in the ongoing care of the patients, to share drug and disease information, and to increase communication

Table II. Recommendations Made to Prevent or Resolve Drug-Related Problems

Type of Recommendation	No.	(% of Total)
Request monitoring	34	(39)
Initiate counselling or compliance device	19	(22)
Change interval	17	(19)
Decrease dose	6	(7)
Increase dose	3	(3)
Stop drug	3	(3)
Substitute drug	3	(3)
Initiate drug	2	(2)
Clarify or interpret	1	(1)
Total	**88**	**(100)[a]**

[a] Percentages do not sum to 100 because of rounding.

between pharmacists at different sites.

At the conclusion of the study, participating community pharmacists were sent an anonymous mail-in questionnaire designed to elicit their views on the usefulness of the project and their willingness to continue the program. Finally, the workload of the

pharmacy resident was documented to determine the time spent for each patient.

RESULTS

Eighteen HIV-positive patients consented to participate in the project. Two patients failed to appear for their appointments; therefore, data were available for 16 patients, 10 (62%) men and 6 (38%) women. The mean age was 37.3 years (range 29 to 74 years). The patients were receiving a mean of 8.25 prescription medications (range 3 to 20) and 5.5 herbal, vitamin, or mineral products (range 0 to 15).

A total of 88 DRPs were identified in the 16 patients (mean 5.5 DRPs/patient; range 3 to 10 DRPs/patient). Only 1 (1%) of the 88 DRPs was considered to be of high priority, whereas 30 (34%) DRPs were of moderate priority, and 57 (65%) were of low priority (Table I). Of the 88 DRPs, 44 (50%) were actual and 44 (50%) were potential. Drug interactions were the most common type of DRP encountered (36/88, 41%); these included both drug-drug and drug-food interactions. Adverse drug reactions (21/88, 24%) and drugs not being received as prescribed (18/88, 20%) were the next most common DRPs identified. Examples of DRPs in the "other" category included improper medication storage and therapeutic failure.

Recommendations made by the pharmacy resident were classified as 1 of 9 types (Table II). Monitoring the patient to re-evaluate the DRP in question was the most freqent type of recommendation (34/88, 39%). Other common interventions included initiating counselling or a compliance device (19/88, 22%) and recommending optimal drug administration times (17/88, 19%).

Eighty-eight recommendations were made; 76 (86%) were directed to patients and 12 (14%) to the physician. Although most recommendations (84/88, 95%) were accepted, 2 recommendations made to patients were rejected and 2 recommendations were accepted with modification.

To evaluate the continuity of care provided for study patients, a brief questionnaire was mailed to the 8 participating community pharmacists. All of the questionnaires were returned, and the results indicated an overall positive response to the continuity-of-care initiative (Table III).

The mean time involved in preparing for, completing, and following up on the initial patient visits was 467 minutes (range 275 to 747 minutes). Fifteen patients were seen once by the pharmacy resident. One patient, who was recovering from an adverse reaction and required a complete change in antiretroviral therapy,

Table III. Results of Questionnaire Administered to 8 Community Pharmacists

Question	No. of respondents
Type of pharmacy	
Independent	2
Chain	3
Franchise	2
Hospital-associated outpatient pharmacy	1
No. of HIV+ patients currently served	
1 to 5	4
6 to 10	1
> 10	3
Services offered to HIV+ patients	
Fill prescriptions	8
Counsel on prescription medications	8
Provide advice on OTC medications	7
Usefulness of continuity-of-care form	
Very useful	7
Fairly useful	1
Not useful at all	0
Form arrived in time to be of use	
Yes	8
No	0
Preferred method of delivery	
Written form sent by mail	1
Written form sent by fax	1
Telephone call	0
Telephone call and form sent by mail	5
Telephone call and form sent by fax	1
Sections of form that were important	
History of HIV-related illnesses	7
Current medications	7
Drug allergies or intolerances	6
Laboratory data	1
Social history	3
Compliance history	5
Past DRPs	7
Current DRPs	8
Guidelines for monitoring DRPs	5
HIV therapeutics literature was helpful	
Yes	8
No	0
Willingness to notify clinic pharmacists of DRPs	
Very willing	6
Fairly willing	2
Not at all willing	0

DRP = drug-related problem, OTC = over-the-counter.

was seen twice. The workload associated with this patient's second visit was 25% of the time involved in the initial visit.

DISCUSSION

This pilot project demonstrated a role for a pharmacist in the Central Saskatchewan Immunodeficiency Clinic. The results suggest that clinical services in this area are both needed and worthwhile and that community pharmacists valued the continuity-of-care aspect of the project.

Many of the patients in this study were taking a large number of prescription medications. Complementary or alternative therapies such as vitamins, minerals, and herbal remedies were prominent in the therapeutic regimens of many patients. This pattern of use was consistent with previous reports.[4] Not surprisingly, a large number of DRPs were identified, and it is likely that if more prescription and alternative medications were added to a patient's regimen, more problems would arise.

The mean number of DRPs per patient in this study was 5.5; most DRPs were considered low priority. Nevertheless, it must be remembered that even low-priority problems are potentially inconvenient to patients and can affect quality of life.

A high proportion of the recommendations for resolving or preventing DRPs were accepted by the physician and the patients. The acceptance rate of over 95% was similar to that observed by others.[12,17] However, in our study, there was no method of confirming or verifying the acceptance rate of recommendations. The results often depended upon the truthfulness of the patients and the perceptions of the pharmacy resident.

The results of the questionnaire administered to the community pharmacists were favourable. All respondents stated that they would be willing to participate in ongoing 2-way communication with an HIV clinic pharmacist to help resolve DRPs and monitor patients. This type of commitment would be necessary if such a program was to be successful on a permanent basis. The success of the continuity-of-care portion of this project is significant; to our knowledge, this is the first reported attempt to provide continuity of care for HIV patients with retail pharmacies outside of health care institutions. Most community pharmacists appreciated receiving copies of recent articles concerning HIV therapy; it would be useful to expand this role in the future.

Given the current patient load and scheduling arrangements (2 or 3 half-day clinics weekly), approximately 16 to 24 h would be required each week to continue this pharmacy service. Any time remaining could be used to expand the program to deliver services that patients and community pharmacists value (such as preparing reading packages for pharmacists).

Major limitations of the project were its short duration and the small sample size. Long-term studies should be conducted to determine the patient outcomes associated with therapeutic interventions made by the HIV clinic pharmacist. Patient outcome could not be assessed accurately in this short study.

A potential source of bias is patient referral by one nurse. In addition, medical decisions reflected the opinion of a single physician, and identification and recommendations for resolving DRPs depended on the skills of the pharmacy resident, who had minimal experience in the area of HIV/AIDS before undertaking the residency. Because of the pharmacy resident's relative lack of experience in the area of HIV therapeutics at the outset of the project, patient work-up required a greater amount of time early in the project than it did by the end of the project.

Future projects should survey clinic personnel regarding satisfaction with the program and areas for improvement. Their input would be essential before a formal, permanent program could be established.

The economic impact of the pharmacist's interventions was not assessed. In view of the high costs for medication encountered by patients with HIV/AIDS, an economic assessment of pharmacists' interventions would also be useful.

This project met its objectives and provides evidence of the value of pharmacists identifying, preventing, and resolving DRPs for HIV/AIDS patients as well as the value of their communicating pharmacy care plans to community pharmacists. These are important clinical pharmacy services to provide to HIV-positive patients who may be faced with complex drug regimens.

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