Community pharmacy rapid influenza A and B screening: A novel approach to expedite patient access to care and improve clinical outcomes

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We believe that the accessibility of community pharmacists places them in a unique position to actively screen and monitor patients for various chronic and acute conditions. The primary goal of this work was to promote further expansion of the pharmacist scope of practice, in order to aid patient outcomes.

Nous croyons que l'accessibilité aux pharmaciens communautaires met ces derniers dans une position unique pour dépister et surveiller activement diverses affections chroniques et aiguës. L'objectif principal de ce travail consiste à faire la promotion de l'élargissement du champ d'exercice des pharmaciens afin d'améliorer les résultats pour les patients.

ABSTRACT

Objective: To investigate the impact and feasibility of community pharmacist-directed influenza screening and to evaluate the proportion of influenza-positive cases that resulted in the initiation of antiviral therapy by pharmacists.

Methods: Patients aged 5 and older with symptoms suggestive of influenza were recruited at 2 Shoppers Drug Mart locations in Toronto, Ontario, from December 12, 2014, to February 4, 2015. Nasal swabs were collected by pharmacists and screened using the BD Veritor system for Rapid Detection of Flu A+B. Positive tests for influenza were reported to patients' physicians and recommendations for antiviral therapy were made when indicated. Supportive care recommendations and telephone follow-up within 48 hours of assessment were provided to all patients.

Results: A total of 59 patients participated in the influenza screening program. Sixty-one percent of patients were at high risk for influenza-related complications, while 15% had more than one risk factor. Thirty-four percent of patients screened positive for influenza, of which 100% were influenza A. Of the patients who screened positive, a prescription for oseltamivir was obtained in 40% of cases. The majority of prescriptions were provided directly to the pharmacy (63%), while the balance was provided after the patients underwent medical examination at the request of their physicians (37%). The pharmacy team offered supportive care to all patients for symptom management. Over-the-counter pharmacotherapy was provided to 85% of patients.

Conclusion: These results highlight the readiness of community pharmacists to participate in the management of patients with influenza and their ability to implement screening into pharmacy workflow. Community pharmacy–based influenza screening may facilitate prompt access to pharmacologic treatment for patients with influenza, as well as decrease burden on the health care system by redirecting influenza-negative patients from physicians' offices and hospitals. Timely physician communication remains a barrier to access to treatment, suggesting a potential key role for advanced pharmacist prescribing. *Can Pharm J (Ott)* 2016;149:83-89.

Introduction

Influenza (or the "flu") is a common infectious respiratory disease that affects millions of Canadians each year.[1,2] During the 2013-2014 influenza season, 5457 hospitalizations and 344 influenza-associated deaths were reported in Canada.[3] Individuals with risk factors such as diabetes, cardiovascular disease and respiratory conditions are particularly susceptible to hospitalizations and complications.[3] Influenza

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KNOWLEDGE INTO PRACTICE

- The BD Veritor System for the detection of influenza is a rapid, point-of-care test used to detect influenza A and B viral antigens from the nasal passages of symptomatic patients.
- Implementation of point-of-care influenza screening into pharmacy practice is feasible and pharmacists can potentially play a significant role in detection and improving timely access to therapy for those patients suffering from symptoms of influenza.
- Timely physician communication remains a barrier to access to treatment, suggesting a potential key role for independent pharmacist prescribing.

epidemics of variable extent and severity occur almost every winter. They impose an enormous burden in terms of morbidity, mortality and economic and social costs. Early detection and management of influenza infections are key in controlling the extent and severity of annual influenza epidemics.

Influenza viruses are transmitted via respiratory droplets or from contact transmission of contaminated surfaces. Symptoms of infection typically include fever, nonproductive cough, chills, headache and myalgia. Untreated patients with influenza exhibit peak viral shedding on the first day of symptom onset, with a steady decline in viral load over the following 7 days.[4] This period of viral shedding has been shown to be prolonged in immunocompromised individuals.[5] Successful treatment with antiviral agents has been demonstrated to significantly decrease both the period of viral shedding and viral load when compared with placebo.[6] Ideally, antiviral treatment for influenza should be initiated as early as possible and is most likely to provide benefit when started within the 48 hours of symptom onset.[7,8] As such, early identification of influenza infection is instrumental in decreasing the duration of symptoms of illness, reducing the risk of influenza-related complications in high-risk individuals and decreasing the risk of contact transmission as a result of decreased viral shedding.[4,9]

The BD Veritor System for the detection of influenza is a rapid, point-of-care test used to detect influenza A and B viral antigens from the nasal and nasopharyngeal passages of symptomatic patients. The system uses a chromatographic immunoassay to differentiate between influenza A and B viral antigens. When the respiratory specimen is added to the test device, influenza A and influenza B antigens bind to the anti-influenza antibodies. The anti-influenza antibodies are conjugated to detector particles. The antigen-conjugate complex then migrates across the test strip to the reaction area, where the membrane captures the antibody-conjugate complex. A positive test for influenza A and/or influenza B is determined by the BD Veritor System Reader when the antigen-conjugate complex is deposited on the corresponding position.[10] The sensitivity of the BD Veritor System is 89.6% and the specificity is 98.8% in comparison to real-time reverse-transcription polymerase chain reaction of nasal swabs.[11]

Historically, patients who visit a pharmacy with fever, cough and malaise are given recommendations for over-the-counter products and offered nonpharmacologic supportive care. Often, patients are referred to a physician for further investigation. In addition, many patients indiscriminately visit physicians' offices seeking antibiotics as a result of upper respiratory tract infections. These visits tie up physicians' time, result in inappropriate antibiotic use and use public resources unnecessarily. For those influenza-positive patients who are not referred, delayed antiviral therapy can lead to prolonged recovery, transmission of disease and/or disease complications. We hypothesize that the availability of this new point-of-care technology will provide pharmacists with the ability to more effectively screen and triage patients and, ultimately, expedite access to care for those influenza-positive individuals. The objective of this pilot program is to investigate the impact and feasibility of community pharmacist–directed influenza screening and to evaluate the proportion of influenza-positive cases that resulted in the initiation of antiviral therapy by pharmacists.

Methods

Patients aged 5 years and older with symptoms suggestive of influenza were recruited at 2 Shoppers Drug Mart locations in Toronto, Ontario, from December 12, 2014, to February 4, 2015. Both locations were offering intranasal flu screening as part of a pilot study to evaluate the effectiveness of the program. Research ethics board approval was not sought, as this initiative was not initially conceived or designed as a research study. Data were collected as part of an internal quality assurance program to evaluate screening services

that were already being provided in different jurisdictions, and no patient was refused access to the service. Implied consent was assumed for patients agreeing to participate in screening. Demographic information and risk factors for influenza complications were collected using a standardized form. Nasal swabs were screened using the BD Veritor system for Rapid Detection of Flu A+B. The test requires that a respiratory sample be obtained from the nostril of a patient, which is then mixed with a reagent. The reagent and sample mixture is then applied to the sample well of the BD Veritor System Flu A+B device that runs the detection test for influenza A and B antigen. The wait time for the test result is 10 minutes, and then results can be interpreted using the BD Veritor System Reader. Positive tests for influenza were reported to patients' physicians, and recommendations for antiviral therapy were made when indicated. Supportive care recommendations and telephone follow-up within 48 hours of assessment were provided to all patients.

Results

A total of 59 patients participated in the influenza screening program. Table 1 summarizes the demographics and clinical presentation of the patient population. Table 2 describes the influenza screening outcomes and the actions taken by pharmacists. Sixty-one percent of patients were at high risk for influenza-related complications, while 15% had greater than 1 risk factor. Thirty-four percent of patients screened positive for influenza, of which 100% were influenza A.

Of the patients who screened positive, a prescription for oseltamivir was obtained in 40% of cases. The majority of prescriptions were provided directly to the pharmacy (63%), while the balance was provided after the patients underwent medical examination at the request of their physicians (37%). Interestingly, 45% of influenza-positive patients had received the seasonal influenza vaccine.

For those positive patients who were not prescribed oseltamivir (12), the pharmacy team was unable to contact the physician in a timely manner in 42% of cases. An additional 42% of patients underwent medical examination at the request of their physicians, and the physicians chose not to prescribe antiviral therapy. Finally, 8% of the patients refused to have the pharmacy contact their physician, and a further 8% declined to visit a walk-in clinic.

MISE EN PRATIQUE DES CONNAISSANCES

- Le System Veritor de BD permettant le dépistage de la grippe constitue un examen rapide à effectuer sur place en vue de détecter la présence d'antigènes des virus grippaux A et B à partir des voies nasales des patients symptomatiques.
- L'implantation du dépistage de la grippe sur place dans le champ d'exercice de la pharmacie est faisable, et les pharmaciens peuvent jouer un rôle important dans le dépistage et l'amélioration de l'accès opportun au traitement par les patients qui présentent des symptômes de la grippe.
- La communication rapide avec les médecins demeure un obstacle à l'accès au traitement, ce qui tend à indiquer que la prescription plus poussée par les pharmaciens pourrait se révéler un rôle essentiel.

The pharmacy team offered supportive care to all patients for symptom management. Over-the-counter pharmacotherapy was provided to 85% of patients. The most commonly recommended medications included acetaminophen (58%), dextromethorphan-containing cough syrup (31%) and antihistamine (20%). At follow-up, all patients we were able to contact (56%) were recovering well and their symptoms were resolving. To our knowledge, none of the patients experienced complications or required hospitalization. There were no findings suggestive of false-negatives, as none of the patients who screened negative showed clinical worsening at follow-up.

Discussion

Our pilot program demonstrates that implementation of the BD Veritor System into pharmacy practice is feasible and that pharmacists can potentially play a significant role in screening, detection and improving timely access to therapy for those patients suffering from influenza. Of the 20 patients who screened positive, 7 were lost to follow-up (physician could not be reached in 5 cases, 1 patient requested physician not be contacted and 1 patient declined to see physician). Of the 13 positive cases that were followed to completion, physicians prescribed oseltamivir for 5 patients based on screening results alone. Physicians requested an office visit with the remaining 8 patients, and oseltamivir prescriptions were written for 3 of these patients following physician examination, resulting in a total of 8 prescriptions written for 13 positive cases. This finding demonstrates that physicians were generally in agreement with screening results and supported pharmacists'

TABLE 1 Patient demographics ($n = 59$)

	n	%
Gender		
Male	21	36
Female	38	64
Median age, y	45 (13-82)	
Symptom presentation		
Onset within 48 h	43	73
Fever	25	42
Cough	44	75
Myalgia	37	63
Headache	33	56
Sore throat	35	59
Running nose	44	75
Nausea/vomiting	7	12
Perceived symptom severity		
Mild	11	19
Moderate	37	63
Severe	1	2
Not documented	10	17
Influenza vaccination status		
Vaccinated	23	39
Unvaccinated	36	61
Risk factors		
Nursing home/chronic care facility	3	5
Pregnant	1	2
≥ 65 y of age	7	12
Obese (body mass index ≥ 40)	1	2
Chronic respiratory disease	7	12
Cardiovascular disease	11	19
Diabetes mellitus, other metabolic disease	4	7
Hemoglobinopathy	1	2
Immunosuppression, immunodeficiency	1	2
Multiple risk (>1 risk factor)	9	15

prescribing recommendations. It is noteworthy that in 5 of 13 (nearly 40%) of cases, physicians were willing to prescribe oseltamivir based on pharmacist recommendations alone, without an office visit. This speaks to the willingness of physicians to collaborate with pharmacists in supporting pharmacy-based screening programs.

We did not seek explanations for why some physicians requested to see patients before prescribing oseltamivir while others did not, although this would be an interesting topic for future investigation, which may help to elucidate means of improving physician–pharmacist collaboration for the diagnosis and treatment of ambulatory conditions. Previous reviews of the literature have found that community pharmacists routinely influence prescribing and that prescribers usually accept pharmacist recommendations.[12-14] It is not clear, however, whether prescribers have the same confidence in accepting pharmacist recommendations that are based on point-of-care screening results. Although we did not perform a formal evaluation of physician perceptions, those we were able to contact

TABLE 2 Flu screen outcomes and actions taken ($n = 59$)

	n	%
Influenza screen results		
Positive	20	34
Influenza A	20	100
Influenza B	0	0
Negative	39	66
Influenza vaccination status		
Positive		
Vaccinated	9	45
Unvaccinated	11	55
Negative		
Vaccinated	14	36
Unvaccinated	25	64
Prescription pharmacotherapy action ($n = 20$ positive)		
Obtained oseltamivir prescription	8	40
Prescription provided directly to pharmacy	5	63
Prescription written following physician-requested medical examination	3	37
Did not obtain oseltamivir prescription	12	60
No prescription written following physician-requested medical examination	5	42
Unable to contact physician	5	42
Patient declined to visit walk-in clinic	1	8
Patient requested physician not be contacted	1	8
Pharmacist recommendations		
Pharmacologic supportive care	50	85
Acetaminophen	34	58
Ibuprofen	4	7
Antihistamine	12	20
Dextromethorphan-containing cough syrup	18	31
Lozenge	11	19
Pharmacist follow-up		
Completed within 48 h	33	56

were generally receptive to collaboration and reacted positively to the initiative. Given the relative novelty of point-of-care testing by community pharmacists, it would be useful to formally assess the perceptions of prescribers regarding the ability of pharmacists to correctly perform and interpret these tests. Such a study would be useful in identifying any barriers to prescriber buy-in, which is critical in order to get the most out of pharmacy-based point-of-care screening. Furthermore, although our work presents a limited example of the outcomes of pharmacy-based infectious disease screening, a larger-scale study with a larger patient population would more convincingly illustrate the positive impact of pharmacist-directed screening on community infectious disease management. A design comparing clinical management and outcomes in pharmacist-screened versus physician-diagnosed influenza cases is also warranted to assess the clinical validity of pharmacist-directed testing. The results of such a study, assuming they are positive, would be invaluable in helping to cement prescriber confidence in treatment recommendations by pharmacists that are based on screening results.

We note that in 5 cases, physicians did not prescribe oseltamivir despite a positive screening result for influenza. We suspect the time lag associated with a physician visit may have delayed initiation of therapy to the point where it would have been too late for patients to benefit from a course of oseltamivir. This time delay represents a major potential barrier to patients receiving timely and effective antiviral treatment in cases of influenza. Our study demonstrates that pharmacists are able to provide a rapid influenza diagnosis that is generally in line with physician diagnostic and prescribing decisions. Unfortunately, we found that in many cases, the benefit of this rapid diagnosis was lost because of the necessity for physician intervention to initiate treatment. The need to contact and/or refer the patient to a physician can delay initiation of treatment, and in cases in which the physician cannot be reached by the pharmacist or visited by the patient in a timely manner, the opportunity for effective treatment may be lost altogether. This barrier could be overcome if pharmacists were granted prescribing authority for oseltamivir. Our results suggest that, with the assistance of a reliable point-of-care diagnostic screening tool, pharmacists can make appropriate prescribing decisions that are beneficial to patients.

Given their high degree of accessibility and availability, pharmacists are already ideally positioned to facilitate this process. We have shown that a point-of-care diagnostic screening test enables pharmacists to provide a rapid, reliable influenza diagnosis on a walk-in basis with minimal waiting. Prescriptive authority would allow pharmacists to initiate treatment, when indicated, as quickly as possible, which could help improve health outcomes (e.g., faster recovery and reduced likelihood of transmission) for patients who might otherwise be unable to reach a physician in a timely manner. As the scope of pharmacy practice continues to evolve, expansion of pharmacist prescribing authority is an ongoing consideration, particularly in provinces such as Ontario, where it is currently limited. Our findings, coupled with the time-sensitive nature of antiviral influenza treatment, suggest that oseltamivir is an ideal candidate for inclusion in the growing repertoire of medications that can be prescribed by pharmacists.

Conclusion

Point-of-care screening technology offers a simple and efficient means for pharmacists to screen and monitor patients for various conditions in the community. The technology applies particularly well to patients presenting at pharmacies with influenza-like illness because of the time sensitivity surrounding initiation of therapy. These results highlight the readiness of community pharmacists to participate in the management of patients with influenza or influenza-like illness and their ability to implement screening into pharmacy workflow. Community pharmacy–based influenza screening may facilitate prompt access to pharmacologic treatment for patients with influenza as well as decrease burden on the health care system by redirecting influenza-negative patients from physicians' offices and hospitals. Timely physician communication remains a barrier to access to treatment, suggesting a potential key role for advanced pharmacist prescribing. ■

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Author Contributions: *J. Papastergiou conceptualized the project, designed the methods for data collection, interpreted the results and contributed to the writing of the manuscript. C. Folkins analyzed and interpreted the results, discussed applicability of the findings and contributed to the writing of the manuscript. W. Li created the Excel algorithms used in the data analysis, enrolled patients into the program and contributed to the interpretation of the results. L. Young enrolled patients into the program, collected data and contributed to the writing of the manuscript.*

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