

ผลของการให้คำแนะนำโดยเภสัชกรในร้านยาเพื่อลดการใช้ยาปฏิชีวนะ อย่างไม่เหมาะสมในผู้ป่วยโรคติดเชื้อทางเดินหายใจส่วนบน

วันชนะ สิงห์หัน, อัญชลี เพิ่มสุวรรณ

ภาควิชาบริบาลเภสัชกรรม คณะเภสัชศาสตร์ มหาวิทยาลัยเชียงใหม่

บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาผลของการให้คำแนะนำแก่ผู้ป่วยโรคติดเชื้อทางเดินหายใจส่วนบนที่เกิดจากการติดเชื้อไวรัส โดยเภสัชกรในร้านยา **วิธีการ:** การวิจัยนี้เป็นการศึกษาแบบกลุ่มเดียวที่เก็บข้อมูลไปข้างหน้าในผู้ป่วยที่มาใช้บริการ ณ ศูนย์ปฏิบัติการเภสัชกรรมชุมชน มหาวิทยาลัยเชียงใหม่ ระหว่างเดือนมีนาคมถึงธันวาคม พ.ศ. 2555 และได้รับการวินิจฉัยว่าเป็นโรคติดเชื้อทางเดินหายใจส่วนบนซึ่งไม่จำเป็นต้องรักษาด้วยยาปฏิชีวนะ ผู้วิจัยใช้ McIsaac score สำหรับประเมินความรุนแรงของโรคและความจำเป็นในการใช้ยาปฏิชีวนะ ผลลัพธ์หลัก คือ สัดส่วนของผู้ป่วยที่ไม่ต้องการใช้ยาปฏิชีวนะภายหลังได้รับคำแนะนำ โดยเภสัชกรเกี่ยวกับโรค การใช้ยา การปฏิบัติตนเอง และการใช้ยาปฏิชีวนะอย่างสมเหตุผล โดยใช้แผ่นพลิกและแผ่นพับที่จัดทำขึ้นเป็นสื่อช่วย ผู้ป่วยที่ไม่ใช้ยาปฏิชีวนะได้รับการติดตามผลการรักษาทางโทรศัพท์ในวันที่ 5 หลังการแทรกแซง **ผลการวิจัย:** ผู้ป่วยทั้งหมด 380 คนเป็นเพศหญิงร้อยละ 58.9 อายุเฉลี่ย 36.9 ปี ผู้ป่วยมีอาการก่อนมารับการรักษาเฉลี่ย 2.3 วัน ส่วนใหญ่มาด้วยอาการเจ็บคอ (ร้อยละ 87.9) ผู้ป่วยมีคะแนนจากการประเมินด้วย McIsaac score อยู่ในช่วง 0 ถึง 3 คะแนน คิดเป็นค่าเฉลี่ย 1.2 ± 0.9 คะแนน ผู้ป่วยจำนวน 240 คน (ร้อยละ 63.2) มีความต้องการใช้ยาปฏิชีวนะ แต่ในจำนวนนี้ 184 คนยินยอมที่จะไม่ใช้ยาปฏิชีวนะภายหลังจากได้รับคำแนะนำจากเภสัชกร ดังนั้นผู้ป่วยทั้งหมด 324 คน (ร้อยละ 85.3) ตัดสินใจไม่เลือกใช้ยาปฏิชีวนะหลังจากได้รับคำแนะนำจากเภสัชกร เภสัชกรสามารถติดตามอาการของผู้ป่วยได้เพียงร้อยละ 21.7 เท่านั้น อย่างไรก็ตามพบว่าผู้ป่วยส่วนใหญ่หายจากโรคภายในระยะเวลา 3.2 ± 1.5 วันหลังได้รับการรักษา **สรุป:** การให้คำแนะนำโดยเภสัชกรในร้านยาเป็นวิธีหนึ่งที่ทำให้ผู้ป่วยได้ใช้ยาปฏิชีวนะอย่างเหมาะสมกับโรคของผู้ป่วย ซึ่งช่วยลดการดื้อยาของเชื้อและลดค่าใช้จ่ายในการรักษาที่ไม่จำเป็นของผู้ป่วย

คำสำคัญ: การให้คำแนะนำ โรคติดเชื้อทางเดินหายใจส่วนบน ยาปฏิชีวนะ ร้านยา

รับต้นฉบับ: 25 ต.ค. 2561, ได้รับบทความฉบับปรับปรุง: 21 พ.ย. 2561, รับลงตีพิมพ์: 12 ม.ค. 2562

ผู้ประสานงานบทความ: วันชนะ สิงห์หัน ภาควิชาบริบาลเภสัชกรรม คณะเภสัชศาสตร์ มหาวิทยาลัยเชียงใหม่ อำเภอเมือง จังหวัดเชียงใหม่ 50200

E-mail : wanchana.s@cmu.ac.th

Effect of Community Pharmacist's Counseling to Reduce Inappropriate Antibiotics Use for Patients with Upper Respiratory Tract Infection

Wanchana Singhan, Unchalee Permsuwan

Pharmaceutical Care, Faculty of Pharmacy, Chiang Mai University

Abstract

Objective: To evaluate the outcomes of pharmacist's counseling in patients with viral associated upper respiratory tract infection (URI) in the community pharmacy. **Methods:** This research was a prospective one-group study collecting the data from the clients receiving the services at Chiang Mai University Pharmacy during March to December 2012 with the diagnosis of URI with no need antibiotic treatment. The researcher employed the McIsaac score to evaluate disease severity and need of antibiotic treatment. The primary outcome was the proportion of patients who accepted treatment with no antibiotics after receiving the counseling about the disease, medications, self-care, and rational use of antibiotics by a pharmacist. Flip chart and brochure were used as assisted media. The patients choosing not to use antibiotics were follow up by phone 5 days after intervention. **Results:** Among 380 patients, 58.9% were female with an average age of 36.9 years. The patients had the symptoms for 2.3 days on average prior to visiting the pharmacy. Sore throat was the most common symptom among subjects (87.9%). The patients had the McIsaac score ranging from 0-3 with the average of 1.2 ± 0.9 . There were 240 (63.2%) patients asking for antibiotics but 184 patients accepted advice not to use antibiotics after counseling with pharmacist. Therefore, the total of 324 patients (85.3%) did not use the antibiotics. Only 21.7% of patients with no antibiotics treatment were able to reach during the follow up. However, most of them were cured within approximately 3.2 ± 1.5 days after receiving treatment. **Conclusion:** Counseling by the pharmacist in the community pharmacy is one of the method to rational antibiotic use which could lead to reduce the problem on bacterial resistance and expenditure for unnecessary treatment in the part of patients.

Keywords: counseling, upper respiratory tract infection, antibiotics, community pharmacy

Introduction

Upper respiratory tract Infection (URI) is one of the most common diseases that cause patients to visit community pharmacies. Virus is the most common pathogen of URI that needs only symptomatic treatment without the need of any antibiotics. (1) Based on the clinical practice guidelines recommended by Infectious Disease Society of America 2012, antibiotics are required only for the treatment of group A beta-hemolytic streptococcus (GAS) tonsillitis or rhinosinusitis. (2) However, most patients were improperly prescribed the antibiotics whether visiting at the hospitals, outpatient clinics or community pharmacies. (3-5) There were only 8% of Thai out-patients with URI in hospital reported with group A beta-hemolytic *Streptococci spp.* associated infection. (6) Inappropriate antibiotic use is not beneficial and can cause harm due to adverse effects and increased risk of antibiotic-resistant bacteria. The pharmacists, especially those in community pharmacy settings, have a role to reduce these problems. (7)

The Antibiotic Smart Use (ASU) program has been launched in Thailand since 2007. It is a collaborative step-wise approach with action research supported by the Thai Food and Drug Administration (Thai FDA). Originally launched to fight against antibiotic resistance chaos, this program aimed to promote rational use of antibiotics among health practitioners. (8) The implementation of the ASU into routine practices was divided into 3 phases; developing of behavior change interventions targeting antibiotic prescribing practices during 2007 to 2008, scaling up the program by integration the ASU into the national health policy during 2008 to 2009, and creating public norms on rational antibiotics use since 2010. Many hospitals have adopted this program and showed some benefits such as reduction of the rate of inappropriate use of antibiotics and drug costs. (9-12)

The participation of pharmacists with other clinical professionals improved the rational use of

antibiotics in hospital settings. (13) However, the data on the ASU and studies regarding the role of community pharmacists are very few. In Thailand, community pharmacists are able to diagnose and treat patients with uncomplicated diseases. Patients with complicated conditions are often referred to the hospitals for appropriate treatment. In general, common antibiotics can be accessed at the community pharmacy. Most URI patients usually visit community pharmacy for mild symptoms due to less waiting time, convenience and accessibility. Patients demanded antibiotics for URI treatment from their perceived usefulness of antibiotics. They often ask and expect to receive antibiotics at the community pharmacy although the pharmacists have no intention to dispense the antibiotics for viral URI. (14) The important part of pharmaceutical care is the improvement of patients' understanding for appropriate use of antibiotics. Therefore, this study was conducted to evaluate the outcomes of pharmacist's counseling in terms of patients' decision regarding antibiotic use in viral URI.

Methods

Study site and participants

This prospective one-group experimental study was conducted at Chiang Mai University Pharmacy during March to December 2012. The study protocol was approved by Institutional Review Board of the Faculty of Pharmacy, Chiang Mai University in 2012. All patients were informed and consent to participate in this study.

Adult patients with viral URI were included if they had McIsaac score (Modified Centor score) (15) of 3 or less, aged 18 years and older, and visited the pharmacy for their own problem on URI. Patients were excluded if they did not agree to participate in the study, had symptoms more than 5 days, or had a sore throat which non-viral infection was suspected (i.e., high use of vocal cord, allergy, sore throat from bacterial infection).

Based on the preliminary survey in January 2012, approximately 10 URI patients per day visited Chiang Mai University Pharmacy. We assumed the same rate in each month; therefore, about 3,000 URI patients would visit Chiang Mai University's pharmacy annually. Sample size in this study was around 353-364 patients based on Taro Yamane's equation (16) for one group-proportional study with 95% confidence interval and alpha of 0.05

Data collection

The pharmacist recorded patient demographic data, asked for symptoms, measured body temperature at patient's forehead by validated infrared thermometer. Patients were asked for their permission whether they allowed pharmacist to check their throats. The Mclsaac score was used to evaluate the severity of URI and the need for antibiotics. (15) This score comprises of 5 points; fever, absence of cough, swollen and tender anterior cervical nodes, tonsil swelling or exudates, and age. Antibiotic is needed when patients had Mclsaac score more than 3 points, where risk of bacterial pathogen for pharyngitis was more than 50%. Only patients with Mclsaac of 3 or less were included in this study as mentioned above, thus the cause of infection was less likely to be *Streptococcus pyogenes* and antibiotics were not necessary.

If the patients asked for antibiotics, the pharmacist would provide 10-15 minutes counseling for such patient at the private counseling room. The counseling message was composed of the difference in signs and symptoms of viral or non-viral URI using a flip chart and brochure as educational aids. Moreover, non-pharmacologic and pharmacologic treatments for different causes of infection were provided. After counseling completion, patients were asked whether they still needed antibiotics for their symptoms. For those who did not use antibiotics were followed up by phone within 5 days after treatment.

Outcomes and data analysis

The primary endpoint was the proportion of patients who chose not to use antibiotics after receiving

the counseling by pharmacist. The cost saving from antibiotic use was the multiplication of the number of patients without antibiotic use, unit cost and quantity of antibiotics. Costs and antibiotic prescribing patterns in the study followed the recommendation of the ASU program. Descriptive statistics (mean \pm standard deviation, SD) were used for data analysis.

Results

There were 380 patients participated in the study. Patients' characteristics were shown in Table 1. Of those, 58.9% were female with an average age of 36.9 ± 15.8 years. Patients had 2.3 ± 1.2 days of URI symptoms prior to visiting the community pharmacy. The URI symptoms were varied, but mostly were sore throat, cough and running nose or sneezing (87.9%, 62.1% and 53.2%, respectively). The average Mclsaac score was 1.2 ± 0.9 and ranged from 0 to 3.

Initially, 240 patients (63.2%) requested antibiotic for URI treatment and the remaining patients (36.8%) did not ask for them. After completion of the counseling for patients who demanded antibiotics, the pharmacist asked them whether they still requested antibiotics. Fifty-six patients (14.7%) insistently requested the antibiotics for their treatment whereas 184 patients (85.3%) changed their decisions. The patients' decisions in antibiotics use were shown in Table 2.

Of all antibiotic groups, penicillin accounted for approximately 80%. Amoxicillin was the most frequently dispensed antibiotic for these patients (42 of 56 patients, 74.9%), followed by roxithromycin, amoxicillin/clavulanate, azithromycin and ciprofloxacin (12.5%, 5.4%, 5.4% and 1.8%, respectively). Besides antibiotics, URI patients still needed symptomatic treatment. Nonsteroidal anti-inflammatory drugs (NSAIDs), the most commonly used medication, were dispensed for 280 patients (73.7%), followed by antihistamines, lozenges, mucolytics, cough suppressants and paracetamol (50%, 46.3%, 37.6%, 22.9% and 9.2% of the patients, respectively).

Table 1. Patients' characteristics

characteristics	number
gender, n (%)	
female	224 (58.9)
male	156 (41.1)
age (year; mean \pm SD)	36.9 \pm 15.8
weight (kg; mean \pm SD)	60.1 \pm 12.2
height (cm; mean \pm SD)	162.7 \pm 8.2
co-morbidity, n (%)	98 (25.8)
cigarette smoking, n (%)	15 (3.9)
alcohol drinking, n (%)	53 (13.9)
drug allergy, n (%)	16 (4.2)
number of days prior coming to pharmacy (day; mean \pm SD)	2.3 \pm 1.2
sore throat, n (%)	334 (87.9)
cough, n (%)	236 (62.1)
running nose / sneezing, n (%)	202 (53.2)
muscle pain, n (%)	127 (33.4)
perception of having fever, n (%)	120 (31.6)
tonsillitis, n (%)	67 (17.6)
body temperature > 38.0 °C, n (%)	12 (3.2)
Mclsaac score	
0, n (%)	89 (23.4)
1, n (%)	154 (40.5)
2, n (%)	114 (30.0)
3, n (%)	23 (6.1)
average, (score; mean \pm SD)	1.2 \pm 0.9

Antibiotics cost saving was shown in Table 3. Cost saving from not taking antibiotics for 184 patients was 38,429 Thai Baht (THB) and 14,485 THB for

branded and generic antibiotics, respectively. Seventy out of 324 (21.6%) patients who did not use antibiotics had been successfully followed up on the phone by the

Table 2. Patients' decision in antibiotic use

after counseling, n (%)	before counseling, n (%)	
	antibiotic requested	antibiotic not requested
antibiotic requested	56 (14.7)	0 (0)
antibiotic not requested	184 (48.4)	140 (36.8)

pharmacist within 5 days after the visit at the pharmacy. Of these, 67 patients' symptoms were cured or subside within 3.2 ± 1.5 days. Three patients (4.3%) went to a hospital and received amoxicillin.

Discussion

The patient knowledge and perception about the antibiotics is also an important key success factor in rational drug use in community pharmacy. This

prospective study was conducted to evaluate the proportion of viral URI patients who accepted not to take the antibiotics after pharmacists' counseling at the community pharmacy. Most patients had mild symptoms. More than 60% of patients requested antibiotics but decreasing to 15% after receiving the counseling by the pharmacist. Approximately 85% of patients understood that viral URI was treatable without antibiotic and accepted not to take antibiotics. Only 20%

Table 3. Patient's antibiotics cost saving after counseling with the pharmacist

		antibiotics cost saving ¹ (THB)	
branded antibiotics	amoxicillin 500 mg 2 tablets twice daily for 5 days	(184 x 74.9% x 7 x 20)	19,294
	roxithromycin 150 mg 1 tablet twice daily for 5 days	(184 x 12.5% x 21 x 10)	4,830
	amoxicillin/clavulanate 1 g 1 tablet twice daily for 5 days	(184 x 5.4% x 67.5 x 10)	6,707
	azithromycin 250 mg 2 tablets once daily for 3 days	(184 x 5.4% x 83 x 10)	4,948
	ciprofloxacin 500 mg 1 tablet twice daily for 5 days	(184 x 1.8% x 80 x 10)	2,650
total			38,429
generic antibiotics	amoxicillin 500 mg 2 tablets twice daily for 5 days	(184 x 74.9% x 3.5 x 20)	9,647
	roxithromycin 150 mg 1 tablet twice daily for 5 days	(184 x 12.5% x 5 x 10)	1,130
	amoxicillin/clavulanate 1 g 1 tablet twice daily for 5 days	(184 x 5.4% x 30 x 10)	2,981
	azithromycin 250 mg 2 tablets once daily for 3 days	(184 x 5.4% x 8.3 x 10)	495
	ciprofloxacin 500 mg 1 tablet twice daily for 5 days	(184 x 1.8% x 7 x 10)	232
total			14,485

1: cost saving = number of patients not taking antibiotic x proportion of a particular antibiotic (if it was used) x price per unit x number of tablets

of patients were successfully followed up but most of them had recovered within 2-3 days.

The result from this study was consistent with that of a previous study in 2013 on 127 patients with pharyngitis who visited Mahasarakham University's pharmacy. Most patients were high school or undergraduate university students. Most of the patients had mild symptoms (McIsaac score: 0-1 score) and needed no antibiotics. Approximately 75% of them were curable and 16% subsided within 3 days without antibiotic use. For patients with McIsaac score of 2-3, 25% did not receive antibiotics for URI treatment while the remaining did. However, the cure rate was not different between the patients who use or did not use antibiotics; 98% and 100%, respectively. (17)

There were quite a large number of participants in this study, which is the strength in this study. But there were also some limitations needed to be taken into consideration. Firstly, due to low success rate of follow-up, the clinical outcome might not be interpreted. Most patients did not receive the phone call and some of them left incorrect or incomplete phone numbers. In addition, some patients lived in different towns or provinces. However, among 70 followed-up patients, 95.7% were cured. Secondly, we conducted only one-group design due to the ethical issue. This is because we as pharmacists in the Chiang Mai University Pharmacy have to provide counseling to all patients. Further prospective study with well-planned follow-up is needed for investigation the clinical outcomes. Thirdly, social desirability effect might lead to the overestimation of the results. To address this effect for further study, different pharmacists should come to play a role as counselor and dispenser.

Conclusion

Pharmacists' counseling is essential in the community pharmacies and also shows benefits. The findings of this study help provide useful information regarding rational use of antibiotic by pharmacy

counseling for patients with URI at Chiang Mai University Pharmacy. The benefits beyond decreasing the inappropriate antibiotic use are saving drug costs and prevention of adverse reactions from unnecessary drugs.

Acknowledgements

The authors would like to thank Faculty of Pharmacy, Chiang Mai University, for providing the facility in this study. This study was funded by Chiang Mai University, Thailand.

References

1. Bennett JE, Dolin R, Blaser MJ. Principles and practice of infectious diseases. 8th ed. Philadelphia: Elsevier Saunders; 2015.
2. Shulman ST, Bisno AL, Clegg HW, Gerber MA, Kaplan EL, Lee G, et al. Clinical practice guideline for the diagnosis and management of group A streptococcal pharyngitis: 2012 update by the Infectious Diseases Society of America. Clin Infect Dis. 2012; 55: 1279-82.
3. Franck AJ, Smith RE. Antibiotic use for acute upper respiratory tract infections in a veteran population. J Am Pharm Assoc. 2010; 50: 726-9.
4. Alabid AHMA, Ibrahim MIM, Hassali MA. Antibiotics dispensing for URTIs by community pharmacists and general medical practitioners in Penang, Malaysia: A comparative study using simulated patients. J Clin Diagn Res. 2014; 8: 119-123.
5. Suttajit S, Wagner AK, Tantipidoke R, Ross-Degnan D, Sitthi-amorn C. Patterns, appropriateness, and predictors of antimicrobial prescribing for adults with upper respiratory infections in urban slum communities of Bangkok. Southeast Asian J Trop Med Public Health. 2005; 36: 489-97.
6. Treebupachatsakul P, Tiengrim S, Thamlikitkul V. Upper respiratory tract infection in Thai adults: prevalence and prediction of bacterial causes, and

- effectiveness of using clinical practice guidelines. J Med Assoc Thai. 2006; 89: 1178-86.
7. Essack S, Bell J, Shephard A. Community pharmacists - leaders for antibiotic stewardship in respiratory tract infection. J Clin Pharm Ther. 2018 ;43: 302-7.
 8. Sumpradit N, Chongtrakul P, Anuwong K, Puntong S, Kongsomboon K, Butdeemee P, et al. Antibiotics smart use: a workable model for promoting the rational use of medicines in Thailand. Bull World Health Organ. 2012; 90: 905-13.
 9. Chongtrakul P. RDU hospital: the pathway to rational drug use. Thai J Pharmacol. 2015; 37: 48-62.
 10. Chantrapipat K, Fongthong T, Saokaew S. Effectiveness of the National Health Security Office 's policy to promote rational use of antibiotics by using payment for quality performance. Thai Journal of Pharmacy Practice. 2017; 9:499-515.
 11. Boonyasiri A, Thamlikitkul V. Effectiveness of multifaceted interventions on rational use of antibiotics for patients with upper respiratory tract infections and acute diarrhea. J Med Assoc Thai 2014; 97:13-19.
 12. Phaliphot V, Chittawattanasarat K, Ruengorn C, Lucksiri A. Effects of antibiotic restriction program in critical care surgery patients at Maharaj Nakorn Chiang Mai Hospital. Thai Pharm Health Sci J. 2015 ; 10: 59-66.
 13. Ananwattanakit M, Usayaporn S, Tantawichien T, Puttlerpong C, Pengsuparp T. Effects of pharmacist participation in an antimicrobial stewardship program on appropriate antibiotic use. Thai Pharm Health Sci J. 2015; 10: 1-9.
 14. Saengcharoen W, Chongsuvivatwong V, Lerkiatbun-dit S, Wongpoowarak P. Factors influencing dispensing of antibiotics for upper respiratory infections among southern Thai community pharmacists. J Clin Pharm Ther. 2008; 33: 123-9.
 15. McIsaac WJ, Kellner JD, Aufricht P, Vanjaka A, Low DE. Empirical validation of guidelines for the management of pharyngitis in children and adults. JAMA. 2004; 291: 1587-95.
 16. Yamane, T. Statistics: an introductory analysis. 2nd ed. New York: Harper Press; 1967.
 17. Uruekoran R, Phonsena W, Thongdang S, Somsard P, Chaiyasong S, Srisilp T. Treatment outcome and cost of rationale antibiotic use implementation in Mahasarakham University pharmacy. Isan Journal of Pharmaceutical Science. 2013;9: 31-42.