Erna Kristin et al /J. Pharm. Sci. & Res. Vol. 9(6), 2017, 845-849

ISSN:0975-1459
Journal of Pharmaceutical Sciences and Research
www.jpsr.pharmainfo.in

The Treatment for Common Cold in Out-Patient Setting in Health Care Service Units Provided by a Coal Mining Company in Indonesia

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Abstract

Common cold is usually caused by viruses. Despite published recommendations, the treatment for common cold in daily practice is not optimal. This study aimed to assess the treatment for common cold in patients attended health service units provided by a coal mining company in Indonesia. This cross-sectional study included 1173 out-patients attended the health care service units provided by a coal mining company in Indonesia and diagnosed with common cold or acute nasopharyngitis during the period between July 2013 to December 2015. Patients' characteristics and prescription data were collected from the patients' medical records and pharmacy units' registry. The drugs prescribed were assessed based on the type, generic classification, agreement with the National Formulary, and a number of drugs per prescription. A total of 2799 prescriptions were analyzed. Drugs prescribed for common cold were often combination drugs (53.7%) and non-generics (57.9%). There were 70% of the drugs not listed in the National Formulary. An average number of drugs in one prescription was 2.39±0.80. Analgesics (32.5%), cough and cold preparations (17.9%), vitamins (15.5%), and systemic antihistamines (7.9%) were the most commonly prescribed drugs. Antibiotics were prescribed in 3.8% prescriptions. The most often prescribed antibiotic was amoxicillin (87.8%). Other drugs not considered effective for common cold were also prescribed, such as corticosteroids (5.9%). In conclusion, the treatment for common cold patients in the health care service units provided by a coal mining company in Indonesia was still not optimal. Many drugs not considered effective for common cold were prescribed, including antibiotics, corticosteroids, and vitamins.

Keywords: common cold, antibiotics, corticosteroids

INTRODUCTION

Acute upper respiratory tract infection is the most common acute illness in children. It creates a considerable burden to children and adults, particularly in developing countries [1]. Furthermore, non-influenza-related viral respiratory tract infection leads to greater economic burden compared to the other diseases, based on direct (health care resource use) and indirect costs (productivity loss) [2]. In India, the incidence of acute respiratory infection was 5.9 per child-year in 1-10 years age group [3]. Meanwhile, in Indonesia, it is one of the most common causes of primary health care visits (40-60%) and hospital visits (15-30%) [4]. Based on the results from Riset Kesehatan Dasar (Basic Health Survey) 2013, the average period prevalence of acute respiratory tract infection was 25%, with the highest prevalence was found in Nusa Tenggara Timur (41.7%), Papua (31.1%), Aceh (30.0%), Nusa Tenggara Barat (28.3%), and Jawa Timur (28.3%). The most common age group who suffered from this infection was the 1-4 years old group (25.8%) [5].

Common cold usually presents as rhinitis and/or pharyngitis along with fever. The cause is mostly respiratory viruses, with rhinovirus as the most common etiological virus. Antibiotics are usually not needed for treatment of common cold [6,7]. Decongestants, antihistamine-decongestant combinations, and intranasal ipratropium are considered effective to treat symptoms of common cold, particularly in adults [7].

Despite these recommendations, the treatment in daily clinical practice is not ideal. Even though common cold is usually viral in etiology, antibiotics are still used to treat the patients. A previous study in China showed that more than half (55%) of the prescriptions given to common cold patients contained an antibiotic, even after a recent training on antibiotic use [8]. Antibiotic overprescribing is associated with many risks, including an increased risk of antibiotic resistance, complications, healthcare costs, and adverse effects [9]. In Indonesia, there were not many studies evaluating the treatment for common cold. The current study aimed to assess the treatment prescribed for common cold in patients attended health service units provided by a coal mining company in Indonesia. The results of this study can be used to improve the treatment for common cold, and eventually the patient clinical outcomes.

METHODS

The participants of this cross-sectional study were obtained from the out-patients registered with and attended the healthcare service units provided by a coal mining company in Indonesia. All patients diagnosed with common cold or acute nasopharyngitis during the period between July 2013 and December 2015 were included in this study. The diagnosis (n = 1173) and prescription data (n = 2799) were collected from the patients' medical records and pharmacy units' registry. The characteristics of the patients were also collected from the medical records.

The drugs prescribed for common cold patients were assessed based on the type (single vs combination), generic classification, agreement with the National

Formulary, number of drugs per prescription, and number of antibiotic drug per prescription. Each drug prescribed was classified based on therapeutic class according to the Anatomical Therapeutic Chemical (ATC) Classification System. Descriptive statistics were used to describe the characteristics of the patients and prescriptions. Frequencies and proportions were reported for each characteristic.

RESULTS

The current study included 1173 patients with common cold, who were prescribed with 2799 prescriptions. The characteristics of the patients are described in Table 1. Most patients were males (80.9%) and were employees of the coal mining company (76.1%). Drugs prescribed for common cold were mostly combination drugs (53.7%) and non-generics (57.9%). Around 70% of the drugs were not in the National Formulary. Only 12.9% prescription contained 1 drug, while the rest contained 2 drugs or more. An average number of drugs in one prescription was 2.39±0.80. Antibiotics were prescribed in 3.8% prescriptions, and in these prescriptions, there was no more than one antibiotic per prescription.

Table 1. Patients' and prescriptions' characteristics

Characteristics	Frequency (%)
Gender (n = 1173)	
Males	949 (80.9)
Females	224 (19.1)
Type of patients (n = 1173)	
Employee	893 (76.1)
Family of employee	280 (23.9)
Type of drugs (n = 2799)	
Single	1295 (46.3)
Combination	1504 (53.7)
Generic drugs (n = 2799)	
Yes	1178 (42.1)
No	1621 (57.9)
Agreement with the National Formulary (n = 2799)	
Yes	834 (29.8)
No	1965 (70.2)
Antibiotic use (n = 2799)	
Yes	107 (3.8)
No	1069 (96.2)
Number of drug in a prescription	
1	151 (12.9)
2	505 (43.1)
3	437 (37.3)
4 or more	80 (6.8)
Mean	2.39
Minimum	1
Maximum	5
Standard Deviation	0.80
Number of antibiotics in a prescription (n = 107)	
1	107 (100.0)
2 or more	0 (0.0)

Table 2 shows the therapeutic classes of drugs prescribed for the common cold patients. Analgesics (32.5%), cough and cold preparations (17.9%), vitamins (15.5%), and systemic antihistamines (7.9%) were the most commonly prescribed. Systemic corticosteroids (5.9%) and anti-inflammatory drugs (4.6%) were also prescribed for common cold in quite a large proportion. The active ingredients of the drugs prescribed for common cold are illustrated in Figure 1. Paracetamol combined with other drugs comprised the largest proportion of the drugs prescribed, followed by ambroxol, paracetamol in a single preparation, cetirizine, and expectorant in combination drugs.

In Table 3, it can be observed that the most common combination prescribed for common cold was the combination of antitussive (dextromethorphan), analgesic-antipyretic (paracetamol), antihistamine (chlorpheniramine), and oral decongestant (phenylpropanolamine). Other combinations include analgesic-antipyretic/antihistamine/oral decongestant and antihistamine/corticosteroid

Table 2. Drugs given for common cold, based on the therapeutic class

Therapeutic Class	Frequency (%)
Analgesics	911 (32.5)
A cough and cold preparations	502 (17.9)
Vitamins	434 (15.5)
Antihistamines for systemic use	220 (7.9)
Corticosteroids for systemic use	166 (5.9)
Antiinflammatory and antirheumatic products	129 (4.6)
Drugs for acid related disorders	117 (4.2)
Antibacterials for systemic use	107 (3.8)
Nasal preparations	21 (0.8)
Others	192 (6.9)

Table 3. Combinations of common cold drugs

Combinations	Frequency (%)
Dextromethorphan, paracetamol, chlorpheniramine, phenylpropanolamine	594 (62.2)
Paracetamol, chlorpheniramine, phenylephrine	158 (16.5)
Ammonium chloride, succus liquiritiae deglycyrrhizinatus, ammonia	95 (9.9)
Betamethasone, dexchlorpheniramine	82 (8.6)
Paracetamol, phenylpropanolamine	27 (2.8)

The most often prescribed antibiotic was amoxicillin (87.8%), and the rest was a combination of sulfonamide and trimethoprim (Table 4). Amoxicillin was prescribed mostly in tablet form (86.0%), while 100% of the sulfonamide-trimethoprim combination was prescribed in tablet form (Table 5).

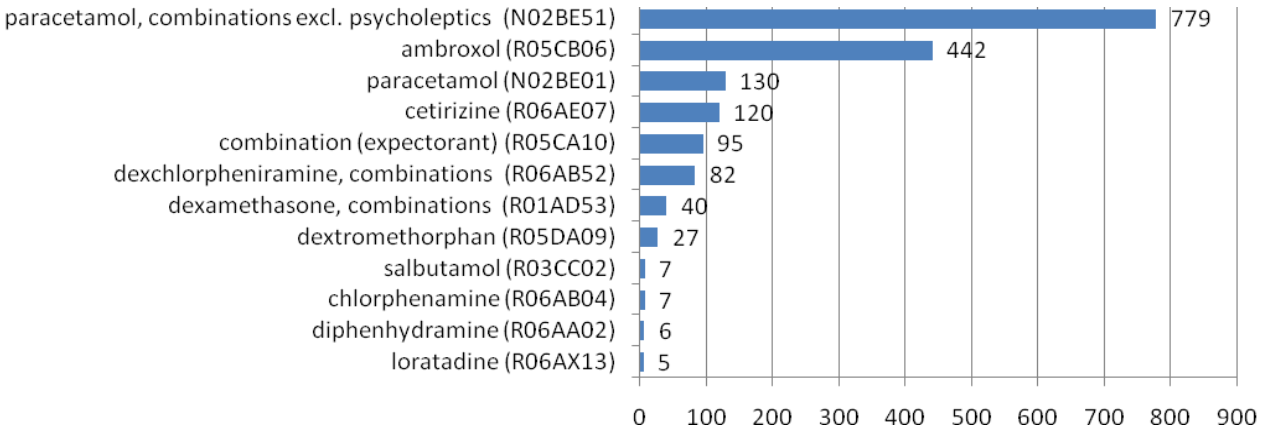

Figure 1. The most frequently used active ingredients to treat common cold

Table 4. Proportion of antibiotics based on drug group

Drug group	Frequency (%)
Penicillins with extended spectrum (amoxicillin)	94 (87.8)
Combinations of sulfonamides and trimethoprim, including derivatives	13 (12.2)

Table 5. Dosage form of the antibiotics

Dosage form	Frequency (%)
Amoxicillin tablet 500 mg	92 (86.0)
Amoxicillin dry syrup 250 mg	1 (0.9)
Amoxicillin syrup 125 mg/5 ml	1 (0.9)
Cotrimoxazole tablet 480 mg	13 (12.1)

DISCUSSION

This study showed that the treatment for common cold in patients attended the healthcare service units provided by a coal mining company in Indonesia was still not optimal. Antibiotics were still prescribed for common cold, although in a small proportion of patients. Furthermore, other drugs not considered effective for common cold were also prescribed, such as corticosteroids.

Common cold is a (usually) viral infection of upper respiratory tract. Rhinovirus is the causal factor for 24-52% cases. Only around 5% of the cases have a bacterial cause, with or without co-infection by a virus. Based on previous meta-analyses and systematic reviews, treatments for common cold considered effective are the combination of an antihistamine with decongestant or analgesic or both and intranasal ipratropium. Acetaminophen is likely effective for fever and pain, and ibuprofen is considered effective for fever control, especially in children. Decongestant monotherapy is considered to have a small benefit for adults, with no data for children. Over-the-counter cough treatment has no benefit in children, with uncertain benefit in adults. Antihistamine monotherapy has no meaningful clinical benefit. Meanwhile, antibiotics have no benefit while they are associated with harms when they are given for common cold [10,11].

Based on those recommendations, treatment for common cold in patients attended the healthcare units needs to be improved. Antitussive dextromethorphan was commonly prescribed (62.2%) along with other symptomatic drugs for common cold in our study. Antitussive is not considered effective in the treatment of common cold, because of its inconsistent benefit in adults, while it does not provide any benefit in children; therefore, antitussive is not recommended for treatment of common cold [11,12]. Our study also showed that 8.6% prescriptions contained corticosteroid betamethasone. According to previous Cochrane review, there was not enough evidence to support the use of corticosteroid for symptomatic treatment of common cold [13]. Vitamins were also prescribed in 15.5% prescriptions in our study. Either vitamin C or vitamin D is not proven to have any benefit in common cold treatment or prevention based on previous meta-analysis and randomized controlled trial, although one review concluded that due to its low cost, vitamin C might be worthwhile for certain patients [11,14,15].

Although the proportion was small, antibiotics were still prescribed in 3.8%. It is possible that a small proportion of the common cold is caused by bacteria, but since the bacterial cause is rarely confirmed in clinical practice, we think that antibiotic prescriptions in the 3.8% patients might not be rational. This proportion is considerably lower compared to that reported in previous studies. In a retrospective case review study in United States of America conducted on patients who visited primary care and emergency room and diagnosed with viral respiratory tract infection, 29% patients with common cold were prescribed antibiotics [16]. In a study using simulated patients of common cold in Malaysia, 65% general practitioners prescribed and dispensed antibiotics for the patients [17]. In Korea, 64.9% physicians prescribed antibiotics to simulated patients with common cold [18]. The proportion was lower in a Scandinavian country like Sweden. In a study in Sweden, only 7.8% patients with common cold in primary care were treated with antibiotics [19].

In our study, the antibiotics prescribed were mostly (87.8%) from the penicillin group (amoxicillin), with the fixed combination of sulfonamide and trimethoprim was prescribed in a smaller proportion (12.2%). This is in line with previous studies. Most (35%) of the antibiotics prescribed in the Malaysian study were from penicillin group, and the rest were antibiotics from macrolides and tetracycline groups. Around 10% antibiotics given in sub-therapeutic doses [17]. Similarly, in Sweden, most antibiotics (68.5%) prescribed were from penicillin group, and the rest were from tetracycline, macrolide, and cephalosporin groups [19].

There are some factors that are associated with the prescription of antibiotics in common cold. In the Sweden study, patients with longer duration of symptoms and higher CRP level were more likely to be prescribed antibiotics [19]. According to a study on patients with respiratory tract infections in Kuwait, patients who presented with fever or sore throat symptoms were more likely to receive antibiotics. In this study, patients diagnosed with common cold were more likely to be prescribed antibiotics [22]. In a study on physicians in Korea, although most physicians (89.4%) agreed that prescribing antibiotics in primary care for common cold may contribute to antibiotic resistance, and although they (89.0%) knew that most common cold is caused by virus, there were still 58.9% physicians who thought that antibiotics were helpful in the treatment of common cold and that antibiotics can reduce the duration (47.0% physicians) and complications (72.8% physicians) of common cold. A lot of physicians (73.3%) thought that they were expected to prescribe antibiotics by the parents of children who suffered from common cold, and 43.8% physicians would prescribe antibiotics if requested even if they thought antibiotics were unnecessary. There were 40.3% physicians who thought that the parents would change doctors if they did not prescribe antibiotics [23]. Physicians with older age were also more likely to prescribe antibiotics [18].

Antibiotic overprescribing is associated with an increased risk of antibiotic resistance [9]. Resistance to antibiotics actually occurs naturally through time, but overuse or misuse of antibiotics may accelerate the development of resistance [20]. Antibiotic resistance would increase medical and societal cost, prolong the duration of hospital stay, and increase mortality [21].

When the prescriptions were compared to the Indonesian National Formulary, we found that there was only 29.8% agreement. National Formulary is a list of drugs of choice necessary and should be available in health care service facilities. If there are necessary drugs not listed in the National Formulary, the drugs can be used in limited condition based on the decision of the local medical committee and director of the healthcare service facility [24]. Although physicians in a healthcare service unit may prescribe other drugs outside of the list, the National Formulary has been developed by considering the most updated evidence for drugs for each disease or disorders commonly found in primary care. This low number of agreement needs to be evaluated, to see whether the prescribing of drugs for common cold was actually rational or not.

Improvement in treatment for common cold can be achieved by (re-)education of physicians and patients on the treatment of common cold and the danger in prescribing or consuming non-effective drugs for common cold. Monitoring the treatment of upper respiratory tract infection may also facilitate the appropriate prescribing for common cold. Previous studies showed that combination of interventions which includes interactive educational sessions, information booklets, communication skill training, feedback, and point-of-care testing (for viral infection) is more effective in reducing antibiotic use in patients with viral respiratory illness [25-28].

CONCLUSION

In conclusion, the treatment for common cold patients in the health care service units provided by coal mining company in Indonesia was still not optimal. Many drugs not considered effective for common cold were also prescribed, including antibiotics, corticosteroids, and vitamins.

ACKNOWLEDGMENT

The authors would like to show their gratitude to the Director of The Health Care Service Units in The Coal Mining Company for sharing their data for this research.

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