Asthma Disorders Therapeutic Interchanges Drug: A Narrative Reviews

Yousef Ahmed Alomi, BSc. Pharm, MSc. Clin Pharm, BCPS, BCNSP, DiBA, CDE, Critical Care Clinical Pharmacists, TPN Clinical Pharmacist, Freelancer Business Planner; Content Editor and Data Analyst, Riyadh, Saudi Arabia.
Faiz Abdullah. Bahadig, RPh, Informatics Pharmacist, Pharmaceutical Care Department, King Abdul-Aziz Medical, City-WR-Jeddah, Ministry of National Guard, Saudi Arabia.

Correspondence:
Dr. Yousef Ahmed Alomi, BSc. Pharm, MSc. Clin Pharm, BCPS, BCNSP, DiBA, CDE, Critical Care clinical pharmacists, TPN clinical pharmacist, Freelancer Business Planner, Content Editor and Data Analyst: PO BOX 100, Riyadh 11392, Riyadh, Saudi Arabia
Phone no: +966504417712
E-mail: yalomi@gmail.com

Received: 07-09-2019;
Accepted: 11-12-2019

Copyright: © the author(s), publisher and licensee International Journal of Pharmacology and Clinical Sciences. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

This is an open access article distributed under the terms of the Creative Commons Attribution Non-Commercial ShareAlike 4.0 License.

Access this article online

www.ijpcs.net

DOI: 10.5530/ijpcs.2020.9.18

Objectives: To analyse the anti-asthmatic medications therapeutic interchanges drug therapy. Methods: It is an extensive search, or fifty databases comprised the following through the Saudi Digital Library (SDL) searching engine. It encompassed the various types of studies (meta-analysis, randomized controlled studies and observational studies) in the English language with human study only for the update May 2017. The search in terms of therapeutic interchange, medication, therapy and type of disease or medication base on therapeutics class of Anti-psychiatric. The medication list and switch from one drug to another based on the literature found the search that has included comparative safety, efficacy and cost of the type of medication for each disease and national or international evidence-based guidelines. Results: The total number of studies after an extensive search with a specific term search was 487 studies. Of those, there were 107 duplicated studies, and 380 studies included for future assessment. After assessment, there were 14 studies about therapeutic interchange of medicines for asthma. Of those 14 studies, one study included for evaluation.

Conclusion: Anti-asthmatic therapeutic interchange studies are occasionally finding in the literature. International asthma management guidelines as an alternative interchange of this matter. Further studies claim to standardized anti-asthmatic therapeutic interchange pharmacy field.

Key words: Asthma, Therapeutic interchanges, Drug, Therapy, Literature, Review.

INTRODUCTION

One of the diseases grieved in the Saudi community was asthma and related diereces. Various international and national published for asthma management for acute or chronic illness, with adults or pediatrics patients. The management of asthma had several steps with multiple pharmacological options. Each pharmacological class had various medication which approximates equals in therapy management and the management team can indicate any of them. Few studies displayed the pharmacological classes could be used interchanged if any problem with each medication or within drug classes other studies the prevalence of using anti-asthma medications and some not engrossed on therapeutic interchange aim. However, there are no international or national guidelines for therapeutic interchange medications. It was seldom finding therapeutic interchange from a group to another group or one drug to one medication it recommended inside the asthma management guidelines. The authors were not familiar with any investigations about the therapeutic interchange of chronic diseases in the Gulf and Middle East countries. The aim of the current project is to review of therapeutic interchange of common diseases asthma with suggested therapeutic interchange protocol as a new initiatives program in the Kingdom of Saudi Arabia.

MATERIALS AND METHODS

It is an extensive search or fifty databases comprised the following through Saudi Digital Library (SDL) searching engine; Willy online library, Web of Science, Springer link, Taylor and Francis, Social Science Journal via ProQuest, Science Journal via ProQuest, Scopus, Scifinder, Science Direct, Sage Journal, Royal Society of Medicine, Royal Society of Chemistry, Psychology Journals via ProQuest. Pharmaceutical news index via ProQuest, patient education via MD consult, Drug via MD consult, Oxford Journals via Oxford University, Ovid Journals, Nursing and Allied Health Sources via ProQuest, Nature Publisher group, Medline index via ProQuest, Medline complete via EBSCO, Medical Evidence Matter via ProQuest, IGI InfoSci Journals, Health Management via ProQuest, Health and Medical complete via ProQuest. Global Health Databases CABI, Family Health via ProQuest, Eric via ProQuest and EBSCO, Emerald, Dynamed via EBSCO, Directory of Open Access Journal (DOAJ), Current Content via Web of Knowledge, Dentistry and Oral Science via EBSCO, Clinical Key -Nursing, Clinical Key- Physician, CINAHL.
via EBSCO, Central via ProQuest, CBCA via ProQuest, Cambridge Journals via Cambridge University, Britannica Academic, BMJ Journals, BMJ Clinical Evidence via BMJ Best Practice, BMJ Best Practice, Biology Journals via ProQuest, ACM Digital Library, Academic Search Ultimate via EBSCO, Journals Cochrane Library Pubmed. In addition to Google, Scholar searched alone without SDL. It comprised the types of studies (meta-analysis, randomized controlled studies and observational studies) in the English language with human study only for the update May 2017. The search in terms of therapeutic interchange, medication, therapy and type of disease or medication base on therapeutics class. The medication list and switch from one drug to another based on the literature found the search, that has comprised comparative safety, efficacy and cost of the type of medication for each disease and national or international evidence-based guidelines.\(^1\)\(^2\)\(^3\)\(^4\)\(^5\) The asthma medication interchange list included drug name, general dosing and frequency. All settings of patient care services inpatient or ambulatory care or community services oral medication included. All dosage form medication will be included in the suggested list. All medications might be registered in the Ministry of Health formulary of the Saudi Food and Drug Authority.\(^13\)\(^14\) The location of studies included Saudi Arabia as top propriety if hasn’t existed Gulf or Middle East counties included, if not found overall counties included. If not existed, the table recommended from the author’s experiences.

**RESULTS**

The total number of studies after an extensive search with a specific term search was 487 studies. Of those, there were 107 duplicated studies, and 380 studies included for future assessment. After assessment, there were 14 studies about therapeutic interchange of medicines for asthma (Figure 1). Of those 14 studies, one study included for evaluation. Other studies did not fit with the criteria. One study discussed conversion from fluticasone/salmeterol to mometasone/formoterol. The research had been done in the USA in 2015. The number of patients exceeds more than 300 patients within two years of the duration of management. That means the number of patients was few and the number of medications interchange was few. The study was a non-randomized controlled but observational design study. The cost saving of the medications interchange not documented (Table 1).

**DISCUSSION**

The management of asthma guidelines is updated periodically.\(^1\)\(^2\)\(^3\)\(^4\) That is related to steps of management in adults or pediatrics and neonates. Besides, it included the acute status of Asthma or chronic situation. The general recommendation of treatment based on scientific research evidence. Staring of steps wise from lower effective medications to the high management in critically ill patients. Various pharmacological classes of drugs used for management that’s including steroid parenteral or oral. Most of the scientific list all types of medications used as parental steroids and any alternative can be used. Besides, all types of oral steroid listed that’s had been used one medications or another one. The therapeutic guidelines mentioned the equivalent doses and route of administration. The system could be used as therapeutic interchange if one drug was not available for any reason to switch to another one listed in the guidelines. Through a very comprehensive search, literateur one study fit with research criteria discussed fluticasone/salmeterol to mometasone/formoterol. It was observational study had been done in USA. There is not study randomized controlled studies used for therapeutic interchange. The asthma therapeutic guidelines list long-acting of beta 2 agonist with their equivalent doses and route of administration. The authors and his colleagues recommended asthma medications therapeutic interchange drove from the update literature of asthma management (Table 2). Most of the doses for adults, while the pediatrics or neonates, should refer to other references for validation. Asthma management therapeutic interchange services is a new initiative project and highly recommended for implementation at all healthcare.
### Table 1: Asthma diseases therapeutic interchanges literature review.

<table>
<thead>
<tr>
<th>No.</th>
<th>Author</th>
<th>Year of publication</th>
<th>Country</th>
<th>No. of participants</th>
<th>Duration</th>
<th>Study design</th>
<th>Outcome</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yip, Elaine et al. (6)</td>
<td>2016</td>
<td>USA</td>
<td>178 of fluticasone/salmeterol compared to 149 of patients while prescribed mometasone/formoterol</td>
<td>Two years</td>
<td>Assess the impact of a therapeutic interchange from fluticasone/salmeterol to mometasone/formoterol on health outcomes in patients with COPD in a large ambulatory and managed care setting</td>
<td>There was a statistically significant reduction in the patients who experienced COPD exacerbations post-conversion from fluticasone/salmeterol to mometasone/formoterol.</td>
<td>non</td>
</tr>
</tbody>
</table>

### Table 2: Suggested asthma disorder Medications therapeutic interchanges.

<table>
<thead>
<tr>
<th>No.</th>
<th>Ordered Drug or Interchange Drug</th>
<th>Ordered Drug or Interchange Drug</th>
<th>Registration (13) (14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Betamethasone 750 mcg IV OR</td>
<td>Betamethasone 750 mcg IV OR</td>
<td>RSFDA , MOHDF</td>
</tr>
<tr>
<td></td>
<td>Hydrocortisone 20mg IV OR</td>
<td>Hydrocortisone 20mg IV OR</td>
<td>RSFDA , MOHDF</td>
</tr>
<tr>
<td></td>
<td>Methylprednisolone 4mg IV</td>
<td>Methylprednisolone 4mg IV</td>
<td>RSFDA , MOHDF</td>
</tr>
<tr>
<td>2</td>
<td>Prednisolone 5mg PO OR</td>
<td>Prednisolone 5mg PO OR</td>
<td>RSFDA, MOHDF</td>
</tr>
<tr>
<td></td>
<td>Betamethasone 750 mcg PO OR</td>
<td>Betamethasone 750 mcg PO OR</td>
<td>RSFDA, MOHDF</td>
</tr>
<tr>
<td></td>
<td>Dexamethasone 750 mcg PO OR</td>
<td>Dexamethasone 750 mcg PO OR</td>
<td>RSFDA, MOHDF</td>
</tr>
<tr>
<td></td>
<td>Methylprednisolone 4mg PO</td>
<td>Methylprednisolone 4mg PO</td>
<td>RSFDA, MOHDF</td>
</tr>
<tr>
<td>3</td>
<td>Mometasone OR 220mcg/puff MDI OR Budesonide OR 90mcg/puff DPI OR Budesonide OR 180mcg/puff DPI OR Beclomethasone OR 40mcg/puff MDI OR Fluticasone 44mcg/puff MDI OR Fluticasone 220mcg/puff MDI</td>
<td>Mometasone OR 220mcg/puff MDI OR Budesonide OR 90mcg/puff DPI OR Budesonide OR 180mcg/puff DPI OR Beclomethasone OR 40mcg/puff MDI OR Fluticasone 44mcg/puff MDI OR Fluticasone 220mcg/puff MDI</td>
<td>RSFDA, MOHDF</td>
</tr>
<tr>
<td></td>
<td>200–400</td>
<td>200–400</td>
<td>RSFDA, MOHDF</td>
</tr>
<tr>
<td></td>
<td>Madei in 1-2 doses 2 times</td>
<td>Madei in 1-2 doses 2 times</td>
<td>RSFDA, MOHDF</td>
</tr>
<tr>
<td>4</td>
<td>Fluticasone propionate/ Salmeterol xinafoate Diskus OR Budesonide /Formoterol fumarate Turbuhaler OR</td>
<td>Fluticasone propionate/ Salmeterol xinafoate Diskus OR Budesonide /Formoterol fumarate Turbuhaler OR</td>
<td>RSFDA, MOHDF</td>
</tr>
<tr>
<td></td>
<td>100-500 mcg/dose, 200-1000 mcg/100 mcg</td>
<td>100-500 mcg/dose, 200-1000 mcg/100 mcg</td>
<td>RSFDA, MOHDF</td>
</tr>
<tr>
<td>5</td>
<td>Montelukast PO OR Zafirlukast PO</td>
<td>Montelukast PO OR Zafirlukast PO</td>
<td>RSFDA, MOHDF</td>
</tr>
</tbody>
</table>

Note: The prescriber should adjust the dose after interchange according to the patient condition

RSFDA: The Drug had been registered in Saudi Food and Drug Authority, MOHDF: The Drug is Ministry of Health Drug Formulary
institutions in the Kingdom of Saudi Arabia with international therapeutic guidelines.15–19

CONCLUSION

Asthma therapeutic interchange protocols or clinical trials were few. Therapeutic interchange randomized controlled studies are required to standardized the anti-asthma therapeutic interchange. Asthma therapeutic management guidelines need to discuss therapeutic interchange system inside the guidelines to validate therapeutic interchange and set-up procedures of anti-asthmatic medications.

ACKNOWLEDGMENT

None.

CONFLICT OF INTEREST

None.

ABBREVIATIONS

MOH: Ministry of Health; KSA: Kingdom of Saudi Arabia; USA: United States of America; TI: Therapeutic Interchange; USD: United States Dollar; SDL: Saudi Digital Library.

ORCID ID

Yousef Ahmed Alomi https://orcid.org/0000-0003-1381-628X

REFERENCES