

# Ophthalmic medication Therapeutic Interchanges : A Narrative Reviews

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## ABSTRACT

**Objective:** To review the ophthalmic medication therapeutic interchanges therapy. **Methods:** It is an extensive search, or fifty databases comprised the following through the Saudi Digital Library (SDL) searching engine. It included 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 evaluation. After evaluation, there were 5 studies had been found discussed the ophthalmic medications. **Conclusion:** Ophthalmic medications therapeutic interchange is rare in finding studies about the topic. It recommended starting generic interchange or evidence-based ophthalmic therapeutic international guidelines.

**Key words:** Review, Ophthalmic, Eye, Therapeutic interchanges, Literature.

## INTRODUCTION

There are various ophthalmic diseases in practice and the management of eye diseases in very critical with multiple classes of medications.<sup>1,2</sup> Each group of drugs had numerous medications. The medicines should be taken continually until the condition is the cure. Otherwise, several complications might occur with the eye. As a result, any missing doses or not available of medications might reflect the management of ophthalmic diseases. One vital solution to prevent any shortage of medicines was a therapeutic interchange of ophthalmic drugs.<sup>3</sup> Few studies conducted as the therapeutic interchange of ophthalmic medications.<sup>4-7</sup> However, most of the studies came as prevalence type of therapeutic interchanges medications. Other studies as a comparison between two or more medicines in the management of specific diseases and commonly found in the setup of therapeutic guidelines management for scientific societies or healthcare institutions.<sup>1</sup> The ophthalmic therapeutic interchange medications are demand during ambulatory care services of ophthalmic clinics to prevent any disturbances of stopping or sudden shortage of drugs. The authors were not aware with any study about ophthalmic therapeutic interchange medications locally or Gulf and Middle East countries. In the current topic, the review of ophthalmic therapeutic interchange medication and advise the medications list of ophthalmic therapeutic interchange as new initiatives for healthcare institutions 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 Database-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, Canadian Science Publishing. 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

Received: 4-6-2019;

Accepted: 13-11-2019

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[www.ijpcs.net](http://www.ijpcs.net)

DOI:  
10.5530/ijpcs.2020.9.24

Search Ultimate via EBSCO, Cochrane Library PubMed. In addition to Google, Scholar searched alone without SDL. It comprised the type of studies (meta-analysis, randomized controlled studies and observational studies) in the English language with human study only for an update in May 2017. The search in term of therapeutic interchange and 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 included comparative safety, efficacy and cost of the type of medication for each disease and national or international evidence-based guidelines.<sup>1,2,8,9</sup> The ophthalmic 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. All medications should include the Ministry of Health formulary. The location of studies included Saudi Arabia as top propriety if hasn't occurred Gulf or Middle East counties included, if not found overall counties included. If not existed, the table suggested from the author's knowledges.

## 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 evaluation. After evaluation, there were there were 5 studies had been found discussed the ophthalmic medications. Two of them were review articles, and 3 were the prevalence of cross-sectional studies related to types of medications used in the therapeutic interchange system. All of the studies not included for evaluation because there were not fitted with research criteria.

## DISCUSSION

The studies about ophthalmic therapeutic interchange are few world-wide, including locally.<sup>4,7</sup> Most of the interchange procedures can be done through comparative efficacy and safety drove from published literature and international therapeutic guidelines.<sup>1,2,8,9</sup> The authors and his colleagues recommended the medications list of the therapeutic interchange (Table 1). A different beta-blocker eye drops with various concentrations used for glaucoma. Besides, prostaglandins analog ophthalmic drops with various concentrations. Steroid eye drops with different medications and concentration can be used instead according to the approved indications. Another ophthalmic

drop pharmacological lass of the medications used for allergies. Antibiotics ophthalmic drops included in the advice list one group-specific for resistance bug-like *Pseudomonas aeruginosa*, the second group for gram-negative bacilli, during the third group for coverage some of the gram-positive and gram-negative infections. If there were one agent for ophthalmic dresses without substitutes, it would not be included in the suggested list. Each healthcare institution should review the list based on its drug formulary, cost and Health insurance coverage. The therapeutic interchange system coordinator should follow up on any discrepancies related to ophthalmic disease management, drug-related problems and patient adherence and compliance. The therapeutic interchange medications list should update occasionally according to the healthcare institution's policy and procedures and follow the international guidelines of therapeutic interchange system.<sup>7,10-13</sup> The ophthalmic therapeutic interchange system is a new initiative project in the Kingdom of

Saudi Arabia and highly encouraged to implement the system with the fitting of new Saudi vision 2030 and Saudi managed care pharmacy.<sup>14,15</sup>

## CONCLUSION

Therapeutic interchange medications used for ophthalmic diseases, not usually used in local or Arabic countries. There were few studies about ophthalmic drug therapeutic interchange. Further studies are compulsory to standardized medications therapeutic interchange used for ophthalmic diseases. However, therapeutic ophthalmic interchange is recommended to start the international ophthalmic guidelines and generic alternatives drug therapy.

## ACKNOWLEDGMENT

None.

## CONFLICT OF INTEREST

None.

## ABBREVIATIONS

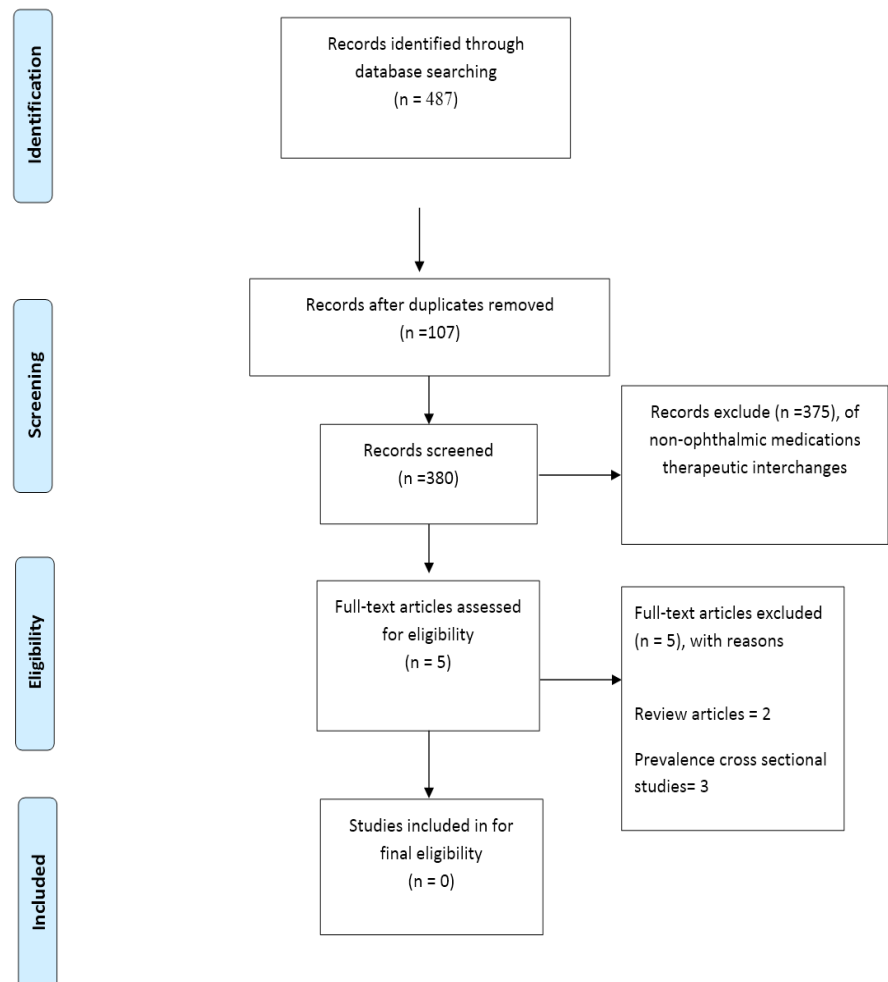


Figure 1: Results of searching the literature.

**Table 1: Suggested Ophthalmic Medications therapeutic interchanges.**

No.	Ordered Ophthalmic Drug or Interchange Ophthalmic Drug(1)(2)(8)			Ordered Ophthalmic Drug or Interchange Ophthalmic Drug			Registration(9)
	Regular Days	Doses/ Day	Frequency Per day	Regular Days	Doses/Day	Frequency Per day	
2.	Levobunolol hydrochloride (0.25,0.5%) OR	as required	as required	levobunolol hydrochloride (0.25,0.5%) OR	as required	as required	RSFDA , MOHDF
	Timolol hemihydrate (0.25,0.5%) OR	as required	as required	Timolol hemihydrate (0.25,0.5%) OR	as required	as required	RSFDA , MOHDF
	Betaxolol hydrochloride (0.25%)	as required	as required	Betaxolol hydrochloride (0.25%)	as required	as required	RSFDA , MOHDF
3.	Bimatoprost (0.01%, 0.03%) OR	as required	as required	Bimatoprost (0.01%, 0.03%) OR	as required	as required	RSFDA , MOHDF
	Travoprost 0.004% OR	as required	as required	Travoprost 0.004% OR	as required	as required	RSFDA , MOHDF
	Latanoprost 0.005% OR	as required	as required	Latanoprost 0.005% OR	as required	as required	RSFDA , MOHDF
	latanoprostene bunod 0.024% OR	as required	as required	latanoprostene bunod 0.024% OR	as required	as required	
	Tafluprost 0.0015%	as required	as required	Tafluprost 0.0015%	as required	as required	
4.	Brinzolamide suspension (1%) OR	as required	as required	Brinzolamide suspension (1%) OR	as required	as required	
	Dorzolamide (2%)	as required	as required	Dorzolamide (2%)	as required	as required	RSFDA , MOHDF
5.	Fluorometholone acetate 0.1% OR	as required	as required	Fluorometholone acetate 0.1% RO	as required	as required	RSFDA , MOHDF
	Prednisolone acetate 0.12%	as required	as required	Prednisolone acetate 0.12%	as required	as required	RSFDA , MOHDF
	Dexamethasone 0.1% OR	as required	as required	Dexamethasone 0.1% OR	as required	as required	RSFDA , MOHDF
	Prednisolone acetate 1% OR	as required	as required	Prednisolone acetate 1% OR	as required	as required	RSFDA
	Prednisolone sodium phosphate 1%	as required	as required	Prednisolone sodium phosphate 1%	as required	as required	RSFDA
6.	Ketorolac tromethamine 0.4% OR	as required	as required	ketorolac tromethamine 0.4% OR	as required	as required	RSFDA
	Olopatadine hydrochloride 0.2%, 0.1%, 0.7%	as required	as required	olopatadine hydrochloride 0.2%, 0.1%, 0.7%	as required	as required	RSFDA , MOHDF
7.	Nedocromil sodium 2% OR	as required	as required	Nedocromil sodium 2% OR	as required	as required	RSFDA
	Cromolyn sodium 4%	as required	as required	Cromolyn sodium 4%	as required	as required	RSFDA
8.	Tobramycin 0.3% OR	as required	as required	Tobramycin 0.3% OR	as required	as required	RSFDA , MOHDF
	Garamycin gentamicin 0.3%	as required	as required	Garamycin gentamicin 0.3%	as required	as required	RSFDA , MOHDF
9.	Ofloxacin 0.3% OR	as required	as required	Ofloxacin 0.3% OR	as required	as required	RSFDA , MOHDF
	Gatifloxacin 0.5% OR	as required	as required	Gatifloxacin 0.5% OR	as required	as required	RSFDA , MOHDF
	Moxifloxacin 0.5%	as required	as required	Moxifloxacin 0.5%	as required	as required	RSFDA , MOHDF
	Ciprofloxacin 0.3% OR	as required	as required	Ciprofloxacin 0.3% OR	as required	as required	RSFDA , MOHDF
	Besifloxacin 0.6%	as required	as required	Besifloxacin 0.6%	as required	as required	
10.	Azithromycin 1% OR	as required	as required	Azithromycin 1% OR	as required	as required	RSFDA
	Erythromycin 0.5%	as required	as required	Erythromycin 0.5%	as required	as required	RSFDA , MOHDF

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

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

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