

Drug therapy for chronic diseases during the holy month of Ramadan: a literature review

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ABSTRACT

Objectives: In this study, we aimed to review the drug therapy for chronic diseases during the holy month of Ramadan. **Methods:** In this study, we conducted an extensive search of 50 databases through the Saudi Digital Library search engine. We included meta-analysis, randomized controlled studies and observational studies published in English language in May 2017. The search terms included Ramadan, fasting, medication, therapy, type of disease, and medication based on therapeutic class. Medication list related to the gastrointestinal tract diseases, asthma and rheumatoid arthritis and the switch from regular days to Ramadan days revealed comparative safety, efficacy studies, cost of type of medication for each disease studies and national or international evidence based guidelines of switching short half-life to long half-life. All parenteral dosage form of medication were excluded from the analysis. All medications should be listed in the MOH drug formulary. **Results:** A total of 710 studies were obtained after an extensive search with specific terms. Of those, 104 studies were duplicate studies and 606 studies were included for further evaluation. The evaluation revealed that 27 studies investigated medications related to the gastrointestinal diseases and Ramadan and 15 studies were about medicines for asthma and rheumatoid arthritis and Ramadan. Of those 42 studies of Ramadan and chronic diseases, only 5 studies were found to be appropriate for further evaluation. The suggested draft of list of medications of chronic diseases from regular days to the Ramadan days is explored in the review. **Conclusion:** The guidelines medications of chronic disease (Asthma, RA, GIT disease) intake during the holy month of Ramadan is not found. The studies of drug schedules in Ramadan does not exist. The investigations about medications therapy of chronic disease are highly recommended in Muslim countries.

Key words: Drug, Therapy, Chronic diseases, Ramadan, Literature, Review.

INTRODUCTION

Each year, the Muslim population celebrates the holy month of Ramadan. Ramadan is a holy month where every Muslim should observe fasting during this month. The fasting begins from sunrise and continues until sunset. During this time, a Muslim should not ingest anything orally including the medication. It is possible that an individual may suffer from any of the chronic diseases, for instance, GIT diseases such as GERD and peptic ulcer, rheumatoid arthritis (RA), asthma and other diseases.¹ During regular days, disease management is not affected; the medications can be taken once or can be taken multiple times. As a result, the patients may break his or her fasting and switch more twice frequency administration of medications.^{2,3} Several studies have discussed the effect of fasting on chronic diseases.³⁻⁵ However, to the best of our knowledge, there are no randomized controlled studies on the switching of medications from regular to Ramadan days in the KSA, Gulf, or in the Middle Eastern countries, as well as in the rest of the world. Most of the previous studies were observational design. Therefore, in this study, we aimed to explore on the use of medications during the holy month of Ramadan and on the switching of medications from regular days to Ramadan days.

METHODS

In this study, we performed an extensive search on 50 databases through the Saudi Digital Li-

brary (SDL) search engine: Wiley Online Library, Web of Science, Springer Link, Taylor and Francis, Social Science Journal accessed via ProQuest, Science Journal accessed via ProQuest, Scopus, SciFinder, Science Direct, Sage Journal, Royal Society of Medicine, Royal Society of Chemistry, Psychology Journals accessed via ProQuest. Pharmaceutical News Index accessed via ProQuest, Patient Education accessed via MD Consult, Drug accessed via MD Consult, Oxford Journals accessed via Oxford University Press, Ovid Journals, Nursing and Allied Health Sources accessed via ProQuest, Nature Publisher Group, MEDLINE index accessed via ProQuest, MEDLINE Complete accessed via EBSCO, Medical Evidence Matter accessed via ProQuest, IGI InfoSci Journals, Health Management accessed via ProQuest, Health and Medical Complete accessed via ProQuest. Global Health Database-CABI, Family Health accessed via ProQuest, Eric accessed via ProQuest and EBSCO, Emerald, DynaMed accessed via EBSCO, Directory of Open Access Journal (DOAJ), Current Content accessed via Web of Knowledge, Dentistry and Oral Science accessed via EBSCO, Clinical Key-Nursing, Clinical Key-Physician, CINAHL accessed via EBSCO, Central accessed via ProQuest, CBCA accessed via ProQuest, Canadian Science Publishing. Cambridge Journals accessed via Cambridge University, Britannica Academic, BMJ Journals, BMJ Clinical Evidence accessed

via BMJ Best Practice, BMJ Best Practice, Biology Journals accessed via ProQuest, ACM Digital Library, Academic Search Ultimate accessed via EBSCO and Cochrane Library PubMed. In addition to Google Scholar searched without SDL searching engine. We included meta-analysis, randomized controlled studies and observational studies published in English language in May 2017. The search terms included Ramadan, fasting, medication, therapy, type of disease and medication based on therapeutic class. The search of medication and switch from regular days to Ramadan days revealed comparative safety studies, efficacy studies and cost of type of medication for each disease studies and national or international evidence based guidelines included of switching short half-life to long half-life.⁶⁻⁸ The gastrointestinal tract medication list included drug name, general dosing and frequency of administration during regular and Ramadan days. Oral medications taken in all settings of patient care services such as inpatient, ambulatory care and community services were included. All parenteral dosage form of medication were excluded from the study. All medications should be listed in the MOH drug formulary. This study included Saudi Arabia, Gulf and Middle Eastern countries for the review; if not found then the rest of the countries were included. If studies evidence not existed; the suggested came from author's experiences.

RESULTS

A total of 710 studies were obtained after an extensive search with specific terms. Of those, 104 were duplicate studies and 606 were included for further evaluation. The evaluation revealed that there were 92 stud-

ies which discussed about the medications related to diabetes mellitus and Ramadan, 27 studies discussed about the psychiatry and Ramadan, 27 studies investigated on the medications related to the gastrointestinal disorders and Ramadan, 30 studies discussed about the use of antibiotics in Ramadan, 30 studies discussed about the cardiovascular medications and Ramadan, 15 studies discussed about medicines for asthma and rheumatoid arthritis and Ramadan and 402 studies discussed about other diseases and Ramadan. Of those 42 studies of Ramadan and chronic diseases, only 5 studies were found to be appropriate for further evaluation. Two of the studies was a review, or systematic systemic, two were observational investigations and one was case study. Four studies discussed about the effect of fasting on medical conditions such as general, gastrointestinal and renal transplant diseases. They did not discuss about the switching of medications. One study discussed regarding the compliance of medications for patients with asthma (Table 1). The suggested draft list of medications of chronic diseases from regular days to the Ramadan days is shown in Table 2.

DISCUSSION

There are several common medical problems in the KSA for instance, asthma, rheumatoid arthritis, renal impairments and so on.¹ In this review, we review the switching of oral medications during Ramadan fasting. In the case of asthma, most of the medications can be taken through the inhaler, which will break the fast. Some medicines can be taken orally with once or twice administration, which can be switched to sunrise and sunset during Ramadan. There are no randomized controlled study to

Table 1: The Chronic Diseases (GIT, RA, Asthma) studies conducted during the holy month of Ramadan.

No	Author	Year of publication	Country	No of participants	Duration	Study design	Outcome	Comments
1	Wheatly, RS Shelly, MP ²	1993	UK	2	10 days	Cases report	Tw cases reported that's stopped their medication inhaled steroid and bronchodilator and during days of the holy of Ramadan lead to critical care admission	Cases report design, few number pf patients
2	Boobes, Y <i>et al.</i> ⁹	2009	Saudi Arabia	22	2 months	Prospective study	It is safe for renal transplant recipients of more than one year and having stable graft function to fast during the month of Ramadan; however caution is advised for moderate to severe impaired renal function.	The study about Safety of fasting during Ramadan
3	Beshyah SA ⁴ <i>et al.</i>	2010	UAE	-	-	Review	The authors discussed the effect of fating the holy month of Ramadan and medical diseases	The authors did not discussed the medication with medical illness
4	Shirin Sadeghpour Parnaz <i>et al.</i> ⁵	2012	Multinational	23 articles		Systemic review	Fasting is generally safe for healthy individuals, but might be hazardous to patients with various GI disease and may increase the risk of complications in this group.	The study about Safety of fasting during Ramadan
5	Aydin, O <i>et al.</i> ³	2014	Turkey	300		Cross sectional interview	Results showed that in a Muslim population, the patients with asthma and COPD do not feel their diseases to be an inhibitory factor for fasting during Ramadan.	The study about Safety of fasting during Ramadan Several factors might affect the adherence to treatment in patients with asthma and COPD

Table 2: Chronic Diseases (GIT, RA, Asthma) Medications during regular days vs. Drug therapy during the holy month of Ramadan.

No	Drug therapy during Regular days ¹⁰⁻¹⁷			Drug therapy during Holy Ramadan			Registration. ^{18,19}
	Regular Days	Doses/ Day	Frequency Per day	Regular Days	Doses/Day	Frequency Per day	
1	Alendronate	10 mg once/d or 70 mg once/wk	In 1 dose	Alendronate	10 mg once/d or 70 mg once/wk	In 1 dose	RSFDA, MOHDF
2	Desloratadine	5 mg	In 1 dose	Desloratadine	5 mg	In 1 dose	RSFDA, MOHDF
3	Bisacodyl	10 mg	In 1 dose	Bisacodyl	10 mg	In 1 dose	RSFDA, MOHDF
4	Budesonide	9 mg	In 1 dose	Budesonide	9 mg	In 1 dose	RSFDA, MOHDF
5	Celecoxib	200 mg	2 times	Celecoxib	200 mg	In 1-2 doses	RSFDA, MOHDF
6	Cimetidine	200-400 mg 800 mg	2 times In 1 dose	Cimetidine	800 mg	In 1 dose	RSFDA, MOHDF
7	Diclofenac	50- 200mg 75 mg	Divided in 3-4 doses 2 times	Diclofenac Diclofenac SR	75 mg 100 mg	2 times In 1 dose	RSFDA, MOHDF
8	Diflunisal	500-1500 mg	Divided in 2-3 doses	Diflunisal	500-1500 mg	Divided in 2-3 doses	RSFDA
9	Esomeprazole	20-40 mg	In 1-2 dose	Esomeprazole	20-40 mg	In 1-2 dose	RSFDA, MOHDF
10	Folic acid	1- 5 mg	In 1 dose	Folic acid	1- 5 mg	In 1 dose	RSFDA, MOHDF
11	Famotidine	20-40 mg 40 mg	2 times in 1 dose	Famotidine	40 mg	In 1 dose	RSFDA, MOHDF
12	Granisetron	1-2 mg	In 1-2 dose	Granisetron	1-2 mg	In 1-2 dose	RSFDA, MOHDF
13	Hydroxychloroquine sulfate	200-400 mg	In 1 dose	Hydroxychloroquine sulfate	200-400 mg	In 1 dose	RSFDA, MOHDF
14	Ibandronate	150 mg once/ month	In 1 dose	Ibandronate	150 mg once/ month	In 1 dose	RSFDA
15	Lanzoprazole	15- 30 mg	In 1 dose	Lanzoprazole	15- 30 mg	In 1 dose	RSFDA, MOHDF
16	Leflunomide	10-20 mg	In 1 dose	Leflunomide	10-20 mg	In 1 dose	RSFDA, MOHDF
17	Loratadine	10 mg	In 1 dose	Loratadine	10 mg	In 1 dose	RSFDA, MOHDF
18	Meloxicam	7.5-15 mg	In 1 dose	Meloxicam	7.5-15 mg	In 1 dose	RSFDA, MOHDF
19	Methotrexate	7.5-25 mg once/ wk	In 1 dose	Methotrexate	7.5-25 mg once/ wk	In 1 dose	RSFDA, MOHDF
20	Montelukast	10 mg	In 1 dose	Montelukast	10 mg	In 1 dose	RSFDA, MOHDF
21	Naproxen	500-1000mg	Divided in 1-2 doses	Naproxen	500-1000mg	Divided in 1-2 doses	RSFDA, MOHDF
22	Nizatidine	150 mg	2 times	Nizatidine	300 mg	In 1 dose	RSFDA
23	Omeprazole	20-40 mg	Divided in 1-2 doses	Omeprazole	20-40 mg	Divided in 1-2 doses	RSFDA, MOHDF
24	Ondansetron	8 mg	In 2 doses	Ondansetron	8mg	In 2 dose	RSFDA, MOHDF
25	Pantoprazole	20-40 mg	In 1 dose	Pantoprazole	20-40 mg	In 1 dose	RSFDA, MOHDF
26	Piroxicam	10-20 mg	In 1 dose	Piroxicam	10-20 mg	In 1 dose	RSFDA
27	Rabeprazole	20 mg	In 1 dose	Rabeprazole	20 mg	In 1 dose	RSFDA
28	Ranitidine	150 mg	2 times	Ranitidine	300 mg	In 1 dose	RSFDA, MOHDF
29	Rivaroxaban	20 mg	In 1 dose	Rivaroxaban	20 mg	In 1 dose	RSFDA, MOHDF
30	Salmeterol Mcg/puff	2 puff	2 times	Salmeterol 21 Mcg/puff	2 puff	2 times	RSFDA, MOHDF
31	Senna	7.5-15 mg	In 1 dose	Senna	7.5-15 mg	In 1 dose	RSFDA, MOHDF
32	Sulindac	200-400 mg	Divided in 2 doses	Sulindac	200-400 mg	Divided in 2 doses	RSFDA

33	Theophylline Plain	Depend on the salt (Blood Level 10-20) mcg/ml)	Divided in 3 doses	Theophylline SR	Depend on the salt (Blood Level 5-15) mcg/ml)	Divided in 2 doses	RSFDA, MOHDF
34	Tramadol	50-100 mg	in 4-6 doses	Tramadol SR	50 mg	2 times	RSFDA, MOHDF
35	Tropisetron	5 mg	1dose	Tropisetron	5 mg	In 1dose	RSFDA, MOHDF
36	Ursodeoxycholic acid	300mg	In 2 doses	Ursodeoxycholic acid	300mg	In 2 doses	RSFDA, MOHDF
37	Zafirlukast 1	20 mg	2 times	Zafirlukast 1	20 mg	2 times	RSFDA, MOHDF
38	RSFDA: The Drug had been registered in Saudi Food and Drug Authority, MOHDF: The Drug is Ministry of Health Drug Formulary.						

validate this switching. There is only a single study regarding the adherence of medications in asthmatic during Ramadan.²In the case of RA, oral management requires several doses of medication to be taken; only a few drugs can be administered once or twice daily. Therefore, the author tried to choose such medications for the treatment of RA during the holy month of Ramadan despite none existed randomized controlled studies or any design of the investigation. We recommend future studies to focus on the complete validation of such designs. In the case of renal failure, patients with renal transplant involved in the safety of fasting Ramadan.⁹ However, there are no randomized controlled studies about the medication requirement by patients with renal transplant. In the suggested table, if the medications can be administered once or twice daily can be converted to the specific time during Ramadan and most of the renal transplant medications can be taken either once or twice during regular days. We recommend extensive clinical trials and investigations for the validation of switching of medicines in the case of chronic diseases to appropriate administration time during the holy month of Ramadan.

CONCLUSION

The clinical studies of most medications of chronic disease (Asthma, RA, GIT diseases) during the holy month of Ramadan has not existed. Clinical trials of medications during Ramadan is suggested during legal new molecule registration Future investigations of medications therapy during Ramadan is highly required in Muslim countries.

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None.


CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

ABBREVIATIONS

MOH: Ministry of Health; KSA: Kingdom of Saudi Arabia; USA: United State of America, RPC: Ramadan Pharmaceutical Care; SDL: Saudi Digital Library.

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