

## Compliance with Glaucoma Topical Treatment During Ramadan in Syrian Population

Diyaa Rachdan<sup>1,2</sup> and Basel Al Faouri<sup>3\*</sup>

<sup>1</sup>Ophthalmology Division, Department of Surgery, Sidra Medicine, Doha, Qatar

<sup>2</sup>Weill Cornell Medicine - Qatar, Doha, Qatar

<sup>3</sup>Eye Surgical Hospital, Damascus, Syria

\*Corresponding Author: Basel Al Faouri, Eye Surgical Hospital, Damascus, Syria.

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### Abstract

**Background:** During the fasting month of Ramadan, the compliance of Muslim patients with their eye topical medications is likely to be affected by their understanding of their religious beliefs of whether taking the eye drops breaks their fast or not.

Through this work, we aim at assessing the compliance of Muslim patients with their topical glaucoma medication during Ramadan. Also to analyze whether any particular factor is likely to affect compliance.

**Materials and Methods:** A questionnaire was handed over to Muslim patients attending the Glaucoma Specialist clinic at a tertiary referral, public sector hospital (Eye Surgical Hospital) in Damascus, Syria during the month of Ramadan in 2013.

In the questionnaire we asked about the changes in frequency and timing of the prescribed glaucoma treatment patients made and whether that was following a medical advice or not.

**Results:** 193 forms collected from respondents and then analyzed. 132 males and 61 females.

126 (65%) of respondents were compliant with their prescribed treatment while 67 (35%) patients modified their treatment in a way or another. Of those who modified their medications, 3 patients stopped their treatment altogether, 7 patients omitted one dose of their treatment and 57 changed the time of instillation of treatment while keeping the same frequency.

Of those 67 who modified their medications, only 8 did that following medical advice while the rest did that at their own discretion. All of those 8 were advised to change the time of instillation of treatment while keeping the same frequency.

A total of 91 (47%) patients obtained medical advice on the safety of modifying their treatment of the remaining 102 patients who did not receive medical advice, they vast majority 82 (80%) showed interest in receiving one.

**Conclusion:** A considerable number of patients change the use of treatment without obtaining medical advice. This is likely to compromise the efficacy of their treatment for the whole month. Ophthalmologists should be aware of the religious beliefs of their patients treat as tailoring treatment where possible to be in line with their beliefs can improve compliance.

**Keywords:** Glaucoma; Ramadan; Compliance; Eye Drops; Treatment

### Abbreviations

IOP: Intraocular Pressure; BID: Twice Daily; TID: Three Times Daily.

**Introduction**

Muslims follow the Islamic lunar calendar in observing their religious duties like Fasting and Hajj. Ramadan is the ninth month of the lunar calendar, it is significant for its additional religious duties, most important of which is Fasting. The lunar months last for 29 or 30 days, depending on sighting of the crescent moon at the beginning of the month, since the lunar calendar is 11 days shorter than the Gregorian calendar, each lunar month starts about 11 days earlier each year from the date it started on according to the Gregorian calendar and hence Ramadan slowly goes round the Gregorian calendar year. This means that after about 33 lunar years Ramadan, would have gone around the whole of the year and the four seasons.

During this month, adult Muslims are to abstain from food and drink from sunrise until sunset.

The sighting of the moonExemptions from fasting are in place for certain categories of people that fasting can adversely affect their health, these exemptions can be either permanent or temporary depending on the condition, for example, women who are pregnant, nursing mothers are temporarily exempted from fasting and have to fast the number of days they were exempted from at a later time, while people who have chronic illnesses that require frequent dosing of medications or in which the fasting itself can affect the control of their medical conditions can be permanently exempted or as long as their condition and wellbeing requires.

It is worth knowing that despite these exemptions, people may choose to fast the whole month. As a result of the long fasting hours, some doses of regular medications are often omitted or changed during fasting periods or even worse the whole medication may be stopped.

Since the day time and night time length are different based on which day of the year we are, fasting total hours can be short if Ramadan falls in winter or can be very long if Ramadan falls in summer (Ranging between 11 hours and 18 hours a day). This brings some difficulty is adjusting regular, long term medical treatment for the fasting Muslim especially in the long fasting hours season.

Glaucoma is a chronic eye condition that in most cases is treated with topical eye drops, there are different anti-glaucoma agents available, and depending on the severity of the condition and the level of intraocular pressure, the patient might be prescribed one or more agents. And these agents may have a frequency of application of once a day, twice a day, three times a day or four times a day.

In a questionnaire-based study performed amongst UK Muslims on different opinions regarding the use of eye drops during Ramadan [1], there were four responses were obtained as in the table:

1	Drops break the fast, but this does not matter because they are excused from the fast because of illness
2	Drops do not break the fast even if they are tasted and reach the stomach, because eye drops do not provide nutrition and this is not a normal route of ingestion
3	Drops do not break the fast as long as they do not reach the throat
4	Drops break the fast irrespective of illness or whether or not they are tasted and should be omitted

**Table a**

It was found that the majority of patients fell into category 4. Regardless of that, the study above highlights the wide variety of understandings of the effect the eye drop use on the fasting during Ramadan. As a result of this, patients may modify their prescribed treatment by stopping, omitting a dose or changing the time of a dose while keeping the same number of doses during the day.

This will indeed have implication on the efficacy of the treatment and the control of the condition.

Other medical specialities like endocrinology, cardiology, and haematology have studied the compliance on treatment during Ramadan and the modifications to treatment patients adopted, whether with medical advice or without [2-7].

There are some studies to assess the extent of non-compliance with topical ophthalmic medication treatment during Ramadan [8-10].

This study was designed to assess the compliance of Muslims with prescribed topical glaucoma treatment during Ramadan. It also assess whether the compliance is better with different number of medication prescribed and also with the frequency of use of drops, it also assess whether educational factors influences compliance.

### Materials and Methods

A one page questionnaire was designed and a form handed over to patients visiting the specialist Glaucoma clinic at a tertiary referral public sector hospital (the Eye Surgical Hospital in Damascus, Syria) during the month of Ramadan in year 2013, the forms were collected and the data entered in an Excel sheet then the results analyzed.

The variables studied were:

- Age
- Sex
- Education: university graduate/less than university graduate
- Number of glaucoma medications used
- Frequency of drop instillation
- Modification of glaucoma treatment during Ramadan:
  - Change the timing of instillation of drops
  - Omit a dose of the treatment
  - Stop treatment altogether.

193 valid forms were received with full information, 61 (32%) of which were females and 132 (68%) were males. The education level was 37 (19%) university graduates and 156 (81%) have less than university degree. The age of the responders ranged between 32 and 75 with the largest group (73 patients) between 60-69 years followed by (56 patients) between 50-59 year of age. The average age was 59 years.

### Results

Nearly half of the respondents (95 patients) were on one anti-glaucoma agent, almost the other half (94 patients) was on two anti-glaucoma agents while a small minority (4 patients) were on three agents.

On the other hand, and when asked about the highest frequency of the medications they are using, 24 patients (12%) were on a medication used once a day, 137 patients (71%) were on medication/s the highest frequency of use was twice a day and finally 32 patients (17%) were on medication/s the highest frequency of which was three times a day

126 (65%) of respondents were compliant with their prescribed treatment while 67 (35%) patients modified their treatment in a way or another. Of the 67 patients who modified their medications we found the following three categories:

- Patients who stopped treatment altogether: 3 patients (4% of those who modified their medications) stopped their treatment altogether, of those, 2 patients were on 2 medications, the highest frequency of which was TID, another patient was on one medication on BID frequency.

- Patients who omitted a dose of the treatment: 7 patients (10% of those who modified their medications) omitted one dose of their treatment, of those 5 patients were on TID and 2 patients were on BID
- Patients who changed the time of instillation of treatment while keeping the same frequency: 57 patients (85% of those who modified their medications) changed the time of instillation of treatment while keeping the same frequency. Out of those, 12 patients were on TID medications, while 45 patients were on BID treatment.

It was interesting to find that of those 67 who modified their medications, only 8 did that following medical advice while the rest did that at their own discretion. All of those 8 were advised to change the time of instillation of treatment while keeping the same frequency.

On the other hand, the total of patients who obtained medical advice on the safety of modifying their treatment was 91 (47%) and clearly the majority of those did not modify their treatment while a small percentage of these (8 patients) were advised that it was reasonably safe to modify the time of instillation of the drops.

When asked about the interest in having a medical advice on whether it is safe to modify treatment, the majority of those 102 patients who did not receive medical advice showed interest in receiving one 82 (80%).

From another point, the frequency of application of drops have the following findings:

- Patient who are using a once daily medication: This group had a total of 24 patients (12.44% of the total number). All of them had full compliance with medication with no modification to their treatment which is expected.
- Patient who are using a twice daily medication: This group had a total of 137 patients (71% of the total number). One patient stopped the treatment altogether, while 2 patients omitted a dose of the treatment and 44 patients changes the time of instillation of treatment while keeping the same frequency.
- Patient who are using a three times daily medication: This group had a total of 32 patients (17% of the total number). Two patients stopped the treatment altogether, while 5 patients omitted a dose of the treatment and 13 patients changes the time of instillation of treatment while keeping the same frequency.

### Discussion

The number of patients in the group that stopped treatment altogether is not significant (3 out of 193), yet the consequences to the control of their condition are very serious, these three patients were two females and one male, all of which did not have a university degree level of education.

The number of patients in the group that omitted a dose of the treatment was again not significant (7 out of 193), yet the effect on the control of their condition can be serious especially that all of them were of older age group (the youngest of which was 64) which means most likely an advanced disease at this age. This group was composed of 5 males and 2 females and again, all of them did not have a university degree level of education.

The number of patients in the group that changed the time of instillation of treatment while keeping the same frequency was the highest of the three groups that modified the treatment, in this group there was 33 males and 24 females which is not correspondent with the representation of males to females in the group (approximately 2:1), i.e. females were more likely to change the time of medications than males. The age distribution of this group in both males and females was ranging between 47 – 74 years with most of the prevalence in their 50s and 60s of age. It was significant to find that a small number of those in this group (6 patients) who were university graduates while the vast majority (51 patients) did not have a university degree level of education. Even when taking out the 8 patient who changed the time of their medications based on a medical advice from these numbers (5 patients who did not have a university degree and 3 patients who had a university degree) that still leaves 3 patients with university degree and 46 patients without which even signifies the

finding that those whose education was below a university degree were much more likely to change the time of their medications and much more likely to do that without a medical advice.

When looking at the effect of the frequency of application needed for the medications, the group which had a medication that is to be applied once a day only had full compliance with no modification to treatment which is understood as there is ample time for a single dose a day in the hours of no fasting. At the same time the group which had medications to be applied twice daily (137 patients) had an insignificant number that stopped or omitted a dose (3 patients together) compared to the vast majority of 44 patients that had to change the time of application of their medications.

When looking at the group that had medications to be applied three times daily (32 patients), two patients stopped the treatment altogether, 5 patients omitted a dose of the treatment while 13 have just changed the time of the medications. Obviously for a change in the time of applying a three times a day medication within the non-fasting hours, that will still significantly affect the efficacy of the treatment and the control of the condition.

The compliance amongst the three frequencies groups is summarized in the following table:

	Total number	Stopped Rx	Omitted Rx	Changed time
OD	24	0	0	0
BID	137	1	2	44
TID	32	2	5	13
Grand Total	193	3	7	57

**Table b**

### Conclusion

This study suggests that patients' compliance with anti-glaucoma topical medications is likely to be reduced during the month of Ramadan with variable possible modifications to treatment.

That is dependent on the interpretations of rules for fasting the individuals believe in and whether the use of eye drops breaks the fast or not since a universal interpretation is not to be expected to be acceptable to all Muslims.

These patients may require education and closer monitoring during this period.

Eye doctors dealing with Muslim patients on anti-glaucoma medications should discuss with their patients whether their beliefs might cause non-compliance and explain that this might lead to further deterioration of the control of their disease.

For glaucoma in particular, where treatment is twice daily, adjusting the time of treatment to non-fasting hours may be an acceptable compromise compared to omitting a dose altogether, a better option of course is to prescribe a medication that is applied once daily where possible, enough and indicated, which is shown in our study to give a full compliance with treatment.

It is worth noting that some of the once daily anti-glaucoma medications are recommended to be used at night time which is very convenient for patients during Ramadan, while others are recommended to be used in the morning. Even though the latter type of medications can be applied the last thing before starting the fast in the early hours before the sun rise, there is still a risk of missing the dose altogether if the individual failed to wake up for the early morning meal (Sohour) or is happy to fast without that meal.

As a result, further studies are needed to provide information in relation to the change in efficacy of treatment caused by modifying the frequency or time of drop administration.

### Conflict of Interest

The authors have no financial or any conflict of interest to declare.

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