

Effect of COVID-19 on control of T1DM patients in Aseer region of Saudi Arabia

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ABSTRACT

Background: The novel corona virus disease, also known as COVID-19, has emerged as a major health concern globally. Its association with comorbid condition has increased its mortality. Diabetes mellitus (DM) is associated with increased risk of infection in comparison to general population. This risk is higher in type 1 DM than type 2 DM. **Methods:** A cross sectional study was done in T1DM patients in whom a structured questionnaire was administered after lockdown. Data regarding social demographical variables, information regarding sugar levels, psychological effects, changes in weight, exercise habits and other variables were included in the validated, electronic questionnaire. Ethic approval was obtained from the Diabetic center Abha, study duration was from January-2020 to October-2020. **Results:** Out of 143 total patients (46.9%) were males while 53.1% were females. Mean \pm S.D of age was obtained 29.6 ± 1.8 . Figure 1 depicted that 23% of the respondents were effected psychologically. Figure 2 depicted that 80.4% used insulin as a treatment. Figure 3 depicted that 8% of the respondents make an emergency visit to the health care centers for high rise in diabetes during lockdown. **Conclusion:** COVID-19 and the lockdown affected the management of T1DM. It resulted in changes in lifestyle, compliance to medication, and psychological impact on the participant.

Keywords: Covid-19, diabetes, lockdown, psychology, type 1

Introduction

The novel corona virus disease, also known as COVID-19, has emerged as a major health concern globally. Its association with comorbid condition has increased its mortality.^[1] Diabetes mellitus (DM) is associated with increased risk of infection

in comparison to general population. This risk is higher in type 1 DM than type 2 DM.^[2,3] Moreover, DM is one of the leading causes of mortality in Covid-19 infected patient.³ However, in spite of high mortality rate with concurrent presence of Diabetes Mellitus and COVID-19, very few studies have been done comparing the mortality in children and adults with Type 1 DM.³ As per the guidelines of International Society for Pediatrics and Adolescent Diabetes (ISPAD) continuous monitoring and awareness towards diabetes has been emphasized in order to avoid the need for hospitalization.^[3,4]

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Lockdown during COVID-19 forced the people to stay indoor resulting in reduced physical activity, alteration in dietary habit and psychological stress. All these factors play important roles in glucose control especially in Type I DM who are on insulin therapy. Moreover, unavailability to use healthcare services also affected the management of DM. Previous studies have reported both short-term and long-term negative effect on diabetic control during natural disasters mainly due to lack of healthcare facilities and unavailability of food.^[5] Recently a study on 147 T1DM patients in Spain, who were on insulin therapy, reported no deleterious impact on glycemic control even after 5 weeks on lockdown imposed due to COVID-19.^[6] Similarly, Bonora *et al.* conducted a study on 20 T1DM patients in Italy. They found a beneficiary effect in glycemic control in the first few weeks of the lockdown. This short term beneficial effect was due to reduced work load and possibility of adequate rest.^[7-9] In a study done in the Kingdom of Saudi Arabia, it was found that although there was minimal psychological stress, the compliance in terms of medication and lifestyle modification was significantly reduced in diabetic patients due to the lockdown.^[10]

Therefore, in the absence of reliable data on the control of T1DM, poor compliance by the patients and increased risk for developing diabetes related complication during the current COVID-19 pandemic, this study was carried out to investigate the impact of COVID-19 induces lockdown on control of T1DM patients in Aseer region of Kingdom of Saudi Arabia.

Methods

A cross sectional study was done in T1DM patients in whom a structured questionnaire was administered after lockdown. Data regarding social demographical variables, Information regarding sugar levels, psychological effects, changes in weight, exercise habits and other variables were included in the validated, electronic questionnaire.

Ethic approval was obtained from the Diabetic center Abha, August, 2020.

Written consent was taken from all the participants, regarding their participation in the survey. Questionnaire was constructed by the panel of experts including diabetes experts, researchers and subject specialists, Cronbach alpha of the questionnaire was obtained to measure the internal consistency of the questionnaire.

Data were entered in SPSS ver. 22 software for analysis. Descriptive statistics (mean, S.D, frequency and percentages) was obtained while inferential statistics was also computed Chi-square test was used to measure the significance differences among the variables. *P* value less than 0.05 was considered as a significant value.

Results

Out of 143 total patients (46.9%) were males while 53.1% were females. Mean \pm S.D of age was obtained 29.6 \pm 1.8 [Table 1].

Figure 1 depicted that 23% of the respondents were affected psychologically. Figure 2 depicted that 80.4% used insulin as a treatment. Figure 3 depicted that 8% of the respondents make an emergency visit to the health care centres for high rise in diabetes during lockdown. Table 2 showed that we have observed the significant difference between HBVA1c levels and type of hospitals (government and private hospitals) Figure 4 showed that 5% of the patients were died. Cronbach alpha of the questionnaire was 0.84.

Discussion

In view of the global COVID-19 pandemic, lockdown was considered as an essential step required to slow down the spread of the virus. It prevented people from leaving their homes and forced them to stay indoors. This study was done on 143 type 1 diabetic patients to describe the impact of lockdown on their glycemic control. Type 1 DM is caused by deficiency of insulin which has adverse effect on glucose utilization. Therefore,

Table 1: Descriptive statistics

	Frequency	Percent
Gender		
Female	76	53.1
Male	67	46.9
Total	143	100.0
Education status		
Postgraduate	7	4.9
Secondary and lower	55	38.5
University	81	56.6
Total	143	100.0
Where to follow Diabetes?		
Government Hospitals	118	80.0
Private Hospitals	25	20.0
Total	143	100.0
Do you measure blood sugar level daily?		
No	45	31.5
Yes	98	68.5
Total	143	100.0

Table 2: Comparison between hospitals and HBVA1c level

Comparisons of Hospitals with respect to HBVA1C level	HBVA1C level					Total
	7	8	9	<7	>9	
	Institute					
Government Hospital						
Count	0	50	11	28	29	118
% within institute	0.0%	42.4%	9.3%	23.7%	24.6%	100.0%
Private hospital						
Count	2	10	2	6	5	25
% within institute	8.0%	40.0%	8.0%	24.0%	20.0%	100.0%
Total						
Count	2	60	13	34	34	143
% within institute	1.4%	42.0%	9.1%	23.8%	23.8%	100.0%

P=0.04

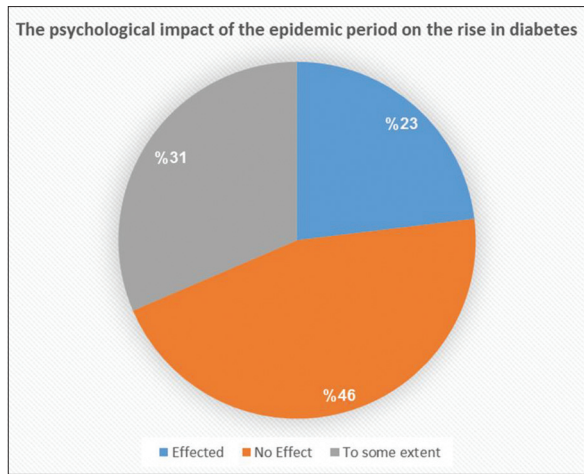


Figure 1: The psychological impact of the epidemic period on the rise in diabetes

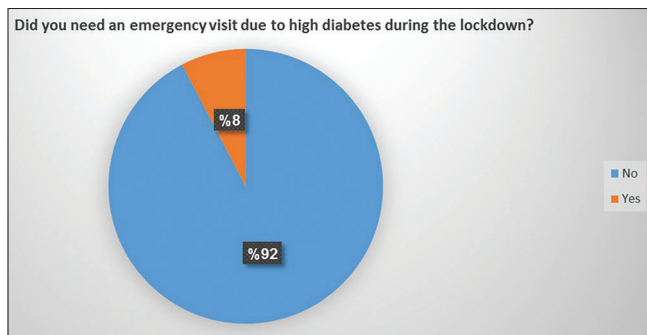


Figure 3: Did you need an emergency visit due to high diabetes during the lockdown?

good glycemic control is important to have a good immunity and prevent both short-term and long-term complications. The fear associated with COVID-19 and the lockdown affected thousands of people in their day to day life. Moreover, it also slowed down the economy. All these factors affected the quality of life and resulted in death of many who were suffering from chronic illness.^[11,10]

Prolonged confinement at a particular place can have adverse psychological effects. In our study we have observed that COVID-19 had psychological impact on 23% of the respondents which was in line with a Danish study which should more greatly concerns about COVID-19 among female diabetics.^[12,13] In our study, although there was no difference with respect to psychological impact among males and females, the patients were distressed and worried about their diabetic control and felt lonely. They were also worried about COVID-19. This could be because DM was considered as a comorbid condition. There is no evidence to support that diabetic patients are susceptible to infection by COVID-19 but diabetic patients are believed to be at a higher risk of developing complication and studies have reported that concurrent presence of DM and COVID-19 is associated with higher mortality. This has been termed as Diabetes Distress.^[14,15]

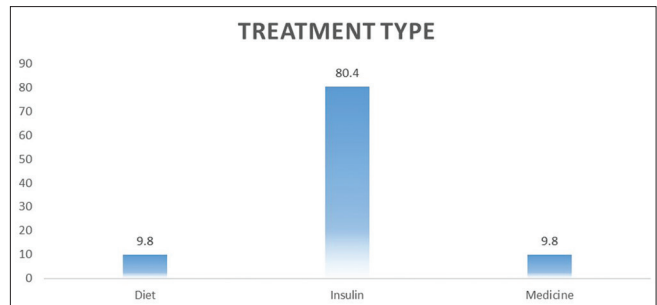


Figure 2: Treatment type

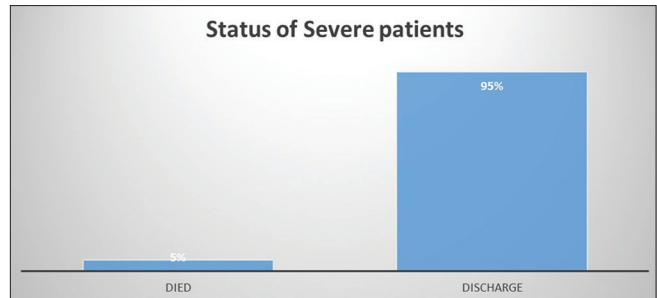


Figure 4: Status of severe patients

As the study group comprised of T1DM, the most common mode of glycemic control was subcutaneous injections of Insulin which was reported by 80.4% of the diabetics. Rest of the diabetics were either on dietary control or some other medication. Similar pattern of medication has been reported in other studies.^[11,16]

Most of the patients preferred to visit government hospitals rather than private hospitals. This was due to factors such as free treatment and medication, consultation through telemedicine and setting up of dedicated clinic for management of diabetes. The findings of this study would help endocrinologist, physicians and health care policy makers to modify their treatment protocol during the pandemic to ensure good glycemic control.

Conclusion

COVID-19 and the lockdown affected the management of T1DM. It resulted in changes in lifestyle, compliance to medication, and psychological impact on the participant. It is also necessary to educate and council the patients regarding home management of DM. However, this study was done at a single center. In order to substantiate our findings more similar studies should be carried out various centers across the kingdom.

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Conflicts of interest

There are no conflicts of interest.

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