Study on the effect of the covid-19 pandemic on diabetes patients with type 2 diabetes mellitus

Albar Putri[1], Karmela Wijaya[1*]

[1,2] Department of Pharmacy, Notokusumo College of Health Sciences Yogyakarta, Tegalrejo, Indonesia

Correspondence Author: Karmela Wijaya

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Abstract

Background

This study geared toward reading the effect of COVID-19 and COVID-19 associated lockdowns on glycemic manipulate in addition to the psycho-social factors in sufferers with type 2 diabetes.

Methods

This changed into a cross-sectional have a look at carried out from a tertiary care middle in Telangana, India. Pre-lockdown and post-lockdown medical elements and the effect of the lockdown on psycho-social elements had been studied in a cohort of 300 sufferers stricken by type 2 diabetes.

Results

The post lockdown post-prandial blood glucose was found to be significantly higher (p=0.035) than the pre-lockdown and also observed higher HbA1c in post lockdown than pre-lockdown (p=0.065). There were varying degrees of anxiety and distress reported in various psycho-social parameters with an overall relatively low average score (2.8 out of 10) on a scale of 0 to 10. Diabetic misery become located to be low, and social aid rankings have been moderately high.

Conclusions

COVID-19 associated lockdowns caused poorer glycemic manage in sufferers tormented by kind 2 diabetes. However, lockdown and COVID-19 associated tension or misery turned into discovered to have a low incidence withinside the studied cohort. It is critical to make sure well timed overview and attention at the best control of continual ailments even at some stage in a lockdown.

Keywords: covid, diabetes, lockdown, anxiety, distress, survey

Introduction

The COVID-19 pandemic has crossed more than 273 million cases and over 5.3 million deaths have been reported globally [1]. As a measure of controlling the unfold of the infection, various countries relied on 'lockdowns' early in the pandemic. These lockdowns have an adverse effect on patients with underlying continual situations including diabetes, where the disruption of a routine diet, routine exercise regimens, regular medical reviews, anxiety, stress, and potential disruption in the supply chain of anti-diabetic drugs resulting in hyperglycemia [2]. In India, the initial lockdown started in the last week of March 2020, followed by serial lockdowns and relaxation of restrictions, which has had a direct impact on the management of chronic diseases [2].

A few reviews have aimed to observe the effect of those lockdowns on glycemic manipulate and diabetes management, however facts at the psychosocial factors were lacking [2-5]. We aimed to observe those elements in a cohort of diabetes sufferers who visited our middle withinside the pre-lockdown and post-lockdown period, alongside the effect of the lockdown on glycemic manipulate.

Methods

This turned into a cross-sectional look at performed in a tertiary care middle in Telangana, India. Adult kind 2 diabetes sufferers who visited the outpatient branch of Endocrinology, Nizam's Institute of Medical Sciences, Hyderabad, India before and after the COVID-19 related lockdown were included in the study. Patients who only visited once, patients suffering from any chronic neurological or psychological illness unrelated to diabetes, and patients aged less than 18 years were excluded from the study. Ethical approval was obtained from the Institutional Ethics Committee. Informed consent was obtained from all the patients.

Definitions and Methods

A questionnaire which includes questions on COVID-19-specific worries as well as such worries related to diabetes, socio-demographic and health status, diabetes-related social support, diabetes distress, and changes in diabetes-related behaviors was developed and pre-tested on a group of 10 volunteers who had been now no longer protected withinside the study.

Socio-demographic and health status items include age, gender, educational level, place of residence, occupation, duration of diabetes, specific diabetic drug classes, regularity of medication intake, complication status, and latest HbA1c measurement as well as questions regarding whether relatives or respondents themselves have experienced COVID-19 symptoms or been recognized with COVID-19 without or with hospitalization are also included.

Procedure

A cross-sectional survey became carried out amongst humans with diabetes to understand how they may be dealing with diabetes in the course of the COVID pandemic. A self-constructed questionnaire which has two main components, one about their medication history of diabetes, presence of any other comorbidities including cardiac and renal disease, and another section about their perception about COVID-19 and its impact on their diabetes was administered after obtaining informed consent by two of the investigators to all patients in English or the local language (Telugu) as per the patient's preference.

Statistical analysis

The data was entered in Microsoft excel 2016. Statistical analysis was carried out by using IBM SPSS, version 20. Continuous variables were described by using mean (S.D.) and proportions for the categorical variables. The paired t-take a look at became used to evaluate the statistical importance to evaluate a established non-stop variable having generally allotted data. A p-value of much less than 0.05 became taken into consideration to be statistically significant.

Results

Socio-demographic parameters

Type 2 diabetes (n=300) sufferers who fulfilled the pre-decided inclusion standards had been enrolled withinside the study. There had been 170 (56.7%) men and 130 (43.3%) woman sufferers. The suggest age of the study topics become 55.35±12.33 years.

Diabetes-related parameters

As shown in table 3, the mean pre-and post lockdown weights were 68.1±11.1 kg and 68.6±11.1 kg respectively. The mean pre-lockdown HbA1c was 8.1±1.9% whereas post lockdown was 8.4±2.1%. The put up lockdown HbA1c turned into determined to be better than the pre-lockdown HbA1c (p=0.067). The mean pre-lockdown post-prandial blood glucose was 217.8±86.2 mg/d whereas in post lockdown was 233.6±97.4 mg/dL.

Diabetic distress parameters

The frequency of responses to the diabetic distress-related questions is summarized. Majority of the patients (70-75%) did now no longer sense beaten with the resource of the usage of the needs of living with diabetes and did now no longer revel in that they may be failing with their diabetes routine.

Table 1: Clinical characteristics of the subjects

Parameter	N =300 (%)
Duration of diabetes (yrs) (mean ± SD)	9.6 ± 7.0
Treatment regimen	
Lifestyle modifications	2 (0.7)
OADDs	176 (58.7)
Insulin	30 (10)
OADDs and insulin	92 (30.6)
Type of OADD	
Metformin	263 (87.7)
Sulphonylurea	181 (60.3)
Thiazolidinedione	3 (1)
α-glucosidase inhibitor	18 (6)
DDP4 inhibitor	93(31)
SGLT-2 inhibitor	27 (9)
GLP-1 analogue	1 (0.3)
Microvascular complications	
Diabetic retinopathy	16 (5.3)
Diabetic nephropathy	30 (10)
Diabetic neuropathy	49 (16.3)
Macrovascular complications	
Cerebro-vascular accident	13(4.3)
Coronary artery disease	47 (15.7)
Peripheral vascular disease	1 (0.3)
Other co-morbidities	
Asthma	4 (1.3)
Cancer	8 (.7)
Thyroid related disorders	62 (20.7)
Rheumatological conditions	9 (3)
Neurological conditions other than stroke	6 (2)

Table 2: Frequency of responses to diabetes-related questions

Question	N = 300(%)
Regular diabetes medications intake over the last 6 months?	280 (93.3)
Difficulty in getting medications over last 6 months?	12 (4)
If yes to the previous question, which diabetic medication was unavailable in the pharmacy? (n=12)	
Metformin	1 (8.3)
Sulphonylurea	2 (16.7)

Thiazolidinedione	0 (0)
Alpha glucosidase inhibitor	0 (0)
DDP4 inhibitor	3 (25)
SGLT-2 inhibitor	3 (25)
GLP-1 analogue	0 (0)
Insulin	3 (25)
Did you have financial problems to buy your diabetic medications?	9 (3)
Did you stop taking any diabetic medications due to financial constraints?	8 (2.7)
Number of visits for diabetes management made post lock down? (mean ± SD)	2 ± 0.9

Table 3: The comparison of diabetes-related parameters in the study in the pre-lockdown and post-lockdown period

Parameter	Pre-lockdown	Post-lockdown	*p value*
Weight (Kg)	68.1±11.1	68.6±11.1	0.58
HbA1c (%)	8.1±1.9	8.4±2.1	0.067
FBS (mg/dL)	160.5±62.3	166.6±68.4	0.259
PPBS (mg/dL)	217.8±86.2	233.6±97.4	0.035*
Frequency of blood sugar monitoring (months)	3.1 ± 0.6		

All values are expressed as mean ± SD

Discussion

This turned into a cross-sectional observe aimed toward reading the effect of COVID-19 and COVID-19 associated lockdowns on glycemic manipulate in addition to the psycho-social components in sufferers with T2DM. We discovered that in the lockdowns for the COVID-19 pandemic, adults T2DM had lockdown-triggered detrimental consequences on glycemic manipulate and diabetes control as measured the usage of blood glucose values. The glycemic manipulate had worsened extensively as evidenced via way of means of the notably better post-prandial blood glucose, and higher glycated hemoglobin values post-lockdown compared to pre-lockdown values. This turned into much like the outcomes stated via way of means of Dalmazi *et al*. in a cohort of grownup and pediatric sufferers with kind one diabetes [4] and via way of means of Ghosal *et al*. [5] who stated a massive boom in HbA1c values in a predictive version analyzing the effect of a whole lockdown on glycemic manipulate in diabetics. A observe executed amongst T2DM sufferers in Turkey further confirmed boom in weight, HbA1C, blood glucose after lockdown length albeit the outcomes had been now no longer statistically massive [11]. The gulf strugglefare which ended in a lockdown of 60 days confirmed insignificant worsening of glycemic manipulate and weight advantage in each T1DM and T2DM sufferers [12]. The cause for better imply glucose values throughout parameters on the give up of the lockdown compared to before, may be because of a couple of elements. A loss of good enough scientific care, ordinary review, loss of workout and alternate in life-style because of last indoors, modifications in diet, and probably tension and pressure triggered via way of means of the pandemic in addition to lockdowns [4-5]. A multinational digital survey approximately domestic confinement confirmed that every day sitting time expanded from five to eight hours consistent with day and the deterioration of consuming quality. [13]. The Indian Government has now no longer laid down any recommendations for workout for human beings in the course of lockdown which additionally contributes to bodily inactivity. In nations like UK, workout recommendations had been in vicinity each for out of doors and indoor sports even in the course of stringent lockdown length. For example, human beings had been allowed to workout with one individual outdoor in their family as soon as a day. The socioeconomic problems because of lockdown can also have an effect on consuming conduct and nutrition. Obesogenic meals with much less healthful substances are cheap, effortlessly organized wherein as healthful and nutritious meals is enormously highly-priced and time ingesting to prepare. We additionally discovered that there had been various ranges of issues related to the effect of the pandemic and the lockdown on underlying diabetes. Overall, the sufferers had a enormously low common score (2.8 out of 10), however nearly one-0.33 of the respondents had issues approximately positive elements which include diabetes being related to extra excessive ailment and poorer results in COVID-19. Although we couldn't discover a comparable record to evaluate our findings to, Nachimuthu *et al*. stated that during a cohort of 100 diabetic sufferers, 40% of them stated feeling tension approximately the COVID-19 pandemic, that's a comparable commentary to ours [14]. Patients with underlying diabetes are discovered to have extra excessive ailment and poorer results in COVID-19 infections [15]. This aspect turned into meditated withinside the issues expressed via way of means of the affected person in our observe, with this being the major supply of tension some of the studied sufferers. Interestingly, in each our observe and in theirs, nearly half the respondents denied any tension associated with the pandemic. With admire to diabetic misery in addition to social relations, the bulk of our sufferers stated excellent guide structures and occasional tiers of pressure and tension. This turned into additionally meditated withinside the social guide evaluation with enormously low ratings in both extreme, ie, sufferers did now no longer experience that they had been missing guide nor had been they being beaten by it. The majority of our sufferers additionally stated that their conduct associated with diabetes had now no longer modified due to COVID-19 or the lockdowns. These findings meditated the findings of Nachimuthu *et al*, wherein their sufferers had been additionally discovered to be preserving energetic and coping with diabetes-associated parameters well [14]. Bala *et al*. [16] stated in a comparable survey searching at diabetes associated misery and different mental pressure associated with COVID-19 amongst diabetic sufferers and discovered that the winning pressure and fear turned into very low. However, those outcomes have to be interpreted with warning and can be geography particular as a big on line survey regarding extra than 2000 respondents throughout India discovered that the superiority of tension turned into 3.3%, of obsession turned into 13.5% and of worry turned into 46.9% withinside the trendy populace [17]. The disparity in our populace may be because of the distinction in scales that had been used to degree those parameters and additionally due to

the fact our questions pertained especially to diabetes and COVID-19 in preference to COVID-19 alone. This enables to keep away from inaccurate reviews while measuring essential parameters like blood glucose and HbA1c. Our observe had a few limitations. We did now no longer degree any of those psycho-social parameters previous to the pandemic on this populace, and therefore a evaluation turned into now no longer possible. The c programming language among the pre-lockdown and post-lockdown parameters had been additionally variable withinside the observe which can have brought about a few confounding elements. The handy sampling approach used withinside the observe couples with the reality that this records turned into acquired from a unmarried middle and might now no longer be consultant of the overall populace and will account for a number of the outcomes primarily based totally on nearby societal norms and culture.

Conclusion

COVID-19 associated lockdowns brought about poorer glycemic manipulate in sufferers affected by T2DM. However, lockdown and COVID-19 associated tension or misery became discovered to have a low incidence withinside the studied cohort. It is critical to make sure well timed evaluation and awareness at the premiere control of continual ailments even at some point of a lockdown. Adequate care should be taken at some point of conditions like those to preserve suitable glycemic manipulate with a purpose to limit the negative outcomes related to COVID-19 in sufferers with diabetes. Ensuring good enough exercising and the precise food plan with well timed get entry to to remedy and clinical assist can serve to enhance glycemic manipulate in addition to lessen tension and pressure related to COVID-19 in diabetic.People have to be knowledgeable approximately availability of teleconsultation centers and have to be recommended to make use of such centers for the control of continual situations like diabetes.

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