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Diabetes & Metabolic Syndrome: Clinical Research & Reviews 14 (2020) 917–920

Contents lists available at ScienceDirect

Diabetes & Metabolic Syndrome: Clinical Research & Reviews

journal homepage: www.elsevier.com/locate/dsx

Original Article

Effects of nationwide lockdown during COVID-19 epidemic on lifestyle and other medical issues of patients with type 2 diabetes in north India

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ARTICLE INFO

Article history:
Received 27 May 2020
Received in revised form
28 May 2020
Accepted 29 May 2020

Keywords:
Type 2 diabetes
COVID-19
Lockdown

ABSTRACT

Background and aims: During the current pandemic of COVID-19, India is under lockdown which could cause disruption in diet and lifestyle in patients with type 2 diabetes (T2DM). We aimed to study lifestyle changes and other common issues related to treatment in our previously seen and treated patients with T2DM.

Methods: Patients (n, 150) who were regularly following up before lockdown were interviewed telephonically (after 45 days of start of lockdown) regarding lifestyle changes, stress and other diabetes-related questions.

Result: Carbohydrate consumption and frequency of snacking increased in 21% and 23% patients, respectively. Interestingly, 27% patients reported an increase in consumption of fruits. Exercise duration was reduced in 42% and weight gain occurred in 19% patients. Frequency of doing self-monitoring of blood glucose (SMBG) was decreased in 23% patients. 'Mental stress' of any kind was reported in 87% patients. Availability of medicines and insulin was uninterrupted in 91% patients. Knowledge about telemedicine was present in 69% and majority (92%) of these patients preferred video consultation.

Conclusion: During 45 days of lockdown increase in carbohydrate intake, decrease in exercise, decreased SMBG and widespread mental stress in patients with T2DM was recorded, factors which may destabilize or exacerbate hyperglycemia and hypertension. Some positive changes (e.g. increased intake of fruits) were also observed.

1. Introduction

After COVID-19 epidemic, Indian Government initiated nationwide lockdown from March 25, 2020 and is currently under a 4th phase of lockdown. This lockdown as a method of counteracting an epidemic mandates people to stay inside their homes, except for carrying out essential activities.

Uncontrolled diabetes has emerged as one of the major risk factors for mortality in patients with COVID-19 [1]. Our recently published mathematical simulation model shows that the nationwide lockdown is estimated to increase the number of patients having uncontrolled diabetes and its complications [2].This may be due to physical inactivity, alterations in dietary habits, difficulty in procuring medications, insulin, glucose test strips or/and inability to seek guidance from physician. Although it is reasonable to assume that these lifestyle changes might occur during lockdown, there are no such data from India.

2. Aim

We hypothesized that prolonged staying at home with limited mobility during lockdown can lead to disruption in diet and lifestyle in patients with type 2 diabetes (T2DM).

3. Methodology

We reviewed records of our previously seen patients with T2DM and selected files of those who had been following up with us

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https://doi.org/10.1016/j.dsx.2020.05.044
1871-4021/

regularly. After obtaining their consent they were asked set of pre-tested 40 questions through telephonic interview, which took about 12 min to complete. These questions were divided broadly into diet, exercise, behavioral aspects, basic knowledge about telemedicine and general questions. Responses were collected on a spread sheet and analysed. We started interviews on May 10, 2020 and finished this task in 7 days' time. Institutional ethics committee approved the study protocol.

4. Statistical analysis

Data were entered on Google spreadsheet. Frequency analysis was done on STATA version 14.1 (STATA Corp, TX, USA).

5. Results

Age distribution of our study population (n, 150) was as follows; 36% were elderly (>60 years), majorly (46.6%) belonged to middle age group (40–60 years), and 16% were less than 40 years of age. Gender distribution was as follows; 62% (93) males and 38% (57) females.

Detailed results are given in Tables 1–3.

5.1. Diet, exercise and weights changes

More than half (56%) of patients reported that they were taking same quantity of diet as before lockdown whereas one fourth (25%) of patients were eating less than before. Half of the patients reported that their meal timings were affected during lockdown period. Quality of diet also changed; carbohydrate consumption increased in 21% whereas 13% patients reported increase in consumption of fat. Increase in consumption of fruits was recorded in 20%, and interestingly, 7% of patients started eating fruits during lockdown. In 23% of patients there was an increase in frequency of snacking (more than 4 times/day). Majority (97%) of patients stated that they did not order food from outside (Table 1).

Some form of exercise was followed by 62% of patients; among them, 44% were doing aerobic exercise, 17% yoga, and 3% resistance exercises. In 25% of patients there was increase in the duration of exercise and, interestingly, more that 50% increase in the duration of exercise was reported in 10% patients. Further, 42% reported there was reduction in their duration of exercise. Changes in weight were reported in 50% patients; of whom 19% stated that they had gained 5–10% weight during lockdown (Table 1).

5.2. Other lifestyle habits, psychological and other issues related to treatment

Majority of the patients were not in the habit of taking alcohol or tobacco in any form. In those who were in habit of consuming alcohol (11%), there were some positive changes; 8% confirmed that there was decrease in their consumption by 50%. Significantly, 87% patients stated that they were 'psychologically affected' because of staying at home. Among them, 10% and 27% of patient said that they had 'low feeling' and decrease in sleep, respectively. For coping stress, 53% patients resorted to watching television, and 16% were engaged in office work (Table 2).

Frequency of self-monitoring of blood glucose (SMBG) was reduced in 23% patients as compared to before lockdown. Easy availability of medicines another positive point, reported by 91% patients. When asked about teleconsultation; 69% patients were aware about it and majority (92%) opted for video consultation (Table 3).

6. Discussion

In our study we noticed mixed responses from patients, both in positive and negative modes, in relation to optimal advice conducive to best health practices.

7. Positive responses

Majority of the patients tried to maintain their diet as before and few of them tried to decrease their carbohydrate (7%) and fat (4%) consumption. Increase in consumption of fruits is an encouraging dietary change. This observation has been reported in a recently published study done in 41 obese Italian children and adolescents, who were monitored for 3 weeks during lockdown [3]. It is interesting that during lockdown home cooked food was consumed by majority of our patients despite availability of processed and home delivered foods in most localities of Delhi.

It is also encouraging that 62% patients continued with physical activity and some even increased it, likely due to the availability of free time. This observation was also noticed in a recently published pilot study from south India where 80% of study population followed physical activity during lockdown [4]. Our participants also reported having some weight loss during lockdown; 33% reported they lost less than or equal to 5% of their body weight, however, this significance of such small amount of weight loss is difficult to ascertain, as the reporting may be erroneous or biased.

An important point which emerged from the interview was regular supply of medications available to the patients; hence this may not be a major reason for uncontrolled glycemia. However, the situation may be different in smaller towns or other suburban areas where supply chain of medicines is likely to be interrupted. Finally, awareness and willingness for teleconsultation is encouraging, particularly when this modality may be an important method of management in future [5], although some roadblocks in its application have been recently noted by us [6].

8. Negative responses

Disruption of meal timings, increased consumption of carbohydrates and increasing snacking as recorded are roadblocks to good glycemic control and may cause weight gain in these patients. These data are similar to those recorded in Italian children and adolescents where intake of potato chips, red meat, and sugar sweetened beverages increased significantly during the lockdown [3]. In addition, decrease in physical activity due to lockdown and closure of parks and gyms, would further exacerbate this situation. To this end, weight gain (5–10%) reported in only 19% patients is surprising but may be confounded by incorrect reporting or underreporting. Importantly, in 23% of patients there was reduced self-monitoring of blood glucose (SMBG), which may pose hurdle to corrective measures for glycemic fluctuations.

Most important issue appears to be heightened 'mental stress' and decrease in sleep duration. Increase in anxiety level is identified as a major factor in a recently conducted online survey in general population during lockdown in India. In this study, more than 80% reported that they were preoccupied with the thoughts of COVID-19 and 12.5% reported sleep disturbances [7]. In another study done in China (n, 1210) during initial stages of COVID-19 pandemic; 53.8% rated the psychological impact of the outbreak as moderate or severe [8]. Mental stress and sleep disturbance in our participant's need in-depth investigations since these could affect compliance to diet, exercise and drugs. These issues become more daunting to patients in absence of advice from physician or psychologist.

Table 1
Diet, exercise, weight and self-monitoring of blood glucose.

Changes in quantity of diet as compared to before	
Same as before (100%)	56 (84)
Eating less than 25–50%[a]	25 (37)
Eating between 50 and 80%[a]	19 (29)
Meal timings	
Same as before	45 (67)
Delayed	31 (46)
Early	13 (20)
Occasionally delayed	11 (17)
Changes in quality of diet	
No change	62 (93)
More carbohydrate intake (rice/roti/ grains)[a]	21 (31)
More fruits and vegetables intake (>3 servings)[a]	9 (14)
More fat intake (ghee, butter, fried foods)[a]	5 (7)
More protein intake (eggs, fish, mutton, pulses, soybean, chickpea flour)[a]	3 (5)
Consumption of sugar	
No consumption of sugar	88 (132)
Increased by 25–50%[a]	7 (10)
Same as before	5 (8)
Consumption of fruits	
Same as before	56 (84)
Increased by 25–50%[a]	20 (29)
Decreased by >50%[a]	17 (26)
Started eating fruit for the first time[a]	7 (11)
Frequency of snacking	
No snacking	30 (45)
Thrice daily	47 (71)
Snacking ≥ four times[a]	23 (34)
Usage of ready-to-cook meals	
Home cooked fresh food only	97 (145)
Ready-to-cook processed foods	2 (3)
Frozen snacks and frozen vegetables	1 (2)
Frequency of ordering food from outside	
None	97 (148)
Once a week	0.7 (2)
Exercise	
No exercise	30 (45)
Aerobic (like cycling/treadmill/running/ skipping/brisk walking)	44 (67)
Others (like yoga)	17 (26)
Resistance exercises	3 (4)
Household work (cleaning, gardening)	3 (4)
Both aerobic and resistance exercise	3 (4)
Exercise duration	
Decreased by 25–50%[a]	42 (63)
Same as before	33 (49)
Increased by 25%[a]	15 (23)
Increased by >50%[a]	10 (15)
Weight change	
No change	48 (72)
Lost <5% of weight[a]	30 (45)
Gained 5–10%[a]	19 (28)
Lost 5% weight[a]	3 (5)
Frequency of self-monitoring of blood glucose frequency	
Same as before	77 (115)
Decreased[a]	23 (35)

[a] As compared to before lockdown period.

Table 2
Other lifestyle habits, Psychological assessment.

Alcohol consumption	
Not applicable	89 (137)
Decreased by 25–50%[a]	8 (8)
Increased by 25–50%[a]	3 (5)
Smoking	
Not applicable	95 (144)
Increased by >50%[a]	3 (4)
Decreased by 25%[a]	2 (2)
Tobacco chewing	
Not applicable	96 (145)
Increased by >50%[a]	2 (3)
Decreased by >50%[a]	2 (2)
Appetite	
No change	67 (100)
Increased by 25–50%[a]	20 (30)
Decreased by 25–50%[a]	13 (20)
Mental stress **	
No	13 (19)
Yes	87 (131)
Irritation	
No	93 (140)
Yes	7 (10)
Feeling 'low'	
No	90 (135)
Yes	10 (15)
Sleep	
No change[a]	57 (85)
Decreased[a]	27 (41)
Increased[a]	16 (24)
Ways to cope with stress	
Watched television	53 (80)
Spent time with family	19 (28)
Office work	16 (24)
Developed new hobbies	9 (13)
Reading books	3 (5)

[a] As compared to before lockdown period, ** mental stress of any kind perceived by patient.

Table 3
Other issues related to treatment.

Aware about telemedicine	
No	31 (47)
Yes	69 (103)
Preferred m ode of tele medicine	
Video consult	92 (138)
Phone call	5 (7)
Email	2 (3)
WhatsApp Chat	1 (2)
Procurement of medicines from chemist	
No	3 (4)
Easy	91 (137)
With difficulty	6 (9)
Delivery of online or dered medicines	
No	6 (8)
Yes	19 (29)
Not practiced	75 (113)

9. Study limitations

These data, collected from a large metropolitan city cannot be extrapolated to smaller towns. The responses were subjective and many factors like weight changes could not be ascertained.

10. Conclusion

During the current pandemic there have been many lifestyle changes noted in our participants. Few of these like taking care of diet and exercise, adding more fruits, having home cooked meals, regular supply of anti-hyperglycemic agents and willingness for teleconsultation could help patients with diabetes maintain good glycemic control. However increased carbohydrate consumption, snacking, physical inactivity, decreased duration of physical activity, reduced SMBG and increase in mental stress are challenging issues and may exacerbate glycemia.

Funding

No funding was received for this article.

Contributors

AM conceived the study and edited the questionnaire and manuscript. AG formulated the questionnaire and wrote the manuscript, BA collected responses, SA analysed and RG contributed to discussion.

Declaration of competing interest

The authors do not mention any conflict of interest regarding this article.

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