RESEARCH ARTICLE

Study to evaluate compliance and adherence to lifestyle modifications in diabetic and hypertensive patients, during lockdown period due to COVID-19 in sample population of Davangere

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ABSTRACT

Background: Coronavirus disease-2019 (COVID-19): A global pandemic, in view of which nation-wide lockdown was imposed, which has affected life of people with diabetes and hypertension. Aim and Objective: The aim of this study is to analyze the impact of lockdown on patient compliance and adherence to lifestyle modifications in patients of diabetes or hypertension or both, in the city of Davangere, Karnataka. Materials and Methods: A questionnaire-based prospective observational study was done in the city of Davangere, Karnataka for 3 months after obtaining consent from patients. Adult patients who have been diagnosed to either diabetes or hypertension or both were identified and their compliance to the treatment and adherence to lifestyle modifications during lockdown period was studied using a questionnaire. Results: The study involved a total of 100 patients with diabetes and hypertension, among which 79 were males, 21 females, and maximum number of patients were middle aged (40–60 years). A number of patients compliant and adherent to medication were 87 before lockdown but 60 during lockdown. Similarly, lockdown has affected follow-up of patients, monitoring of parameters, diet, exercise, and psychological health of patients. Conclusion: The observations in our study emphasize that, nation-wide lockdown in view of COVID-19 infection, has adversely affect lifestyle habits, compliance, and adherence to medication, also the psychological health of patients with diabetes and hypertension, which would further affect their disease process.

KEY WORDS: Diabetes; Hypertension; Compliance; Lockdown; Coronavirus Disease-2019

INTRODUCTION

Diabetes is one of the common metabolic disorders that is characterized by high blood glucose either due to insufficient insulin production or decreased or non-responsiveness of the tissues to insulin. Later, Type II diabetes is more common constituting about 90%. Diabetes can be managed through both pharmacological and non-pharmacological approaches such as lifestyle interventions thus reducing the burden of the disease.[1-3]

Hypertension is a major non-communicable disease and also a major cause of mortality and morbidity all over the world.[4-7] Developing countries, especially Asian countries, are expected to have highest increase in incidence of hypertension.[8] Researchers believe that regular antihypertensive medication as well as lifestyle modification will result in the best therapeutic effect in hypertensive patients.[9] Globally, hypertension and diabetes are the core contributors to the burden of non-communicable diseases and they often coexist.
They pose a major public health problem to the population as they require long-term treatment adherence and carry risk of various microvascular and macrovascular complications.[10]

Coronavirus disease-2019 (COVID-19) is caused by the coronavirus severe acute respiratory syndrome coronavirus-2 and is spreading rapidly across the world. The disease is highly contagious as the virus is primarily transmitted by respiratory droplets between people. The incubation time is on average 6–8 days, followed by 1–2 weeks of symptomatic disease. The infection can be asymptomatic (yet remain infectious) in part of the population but classically symptoms may include cough, fever, sore throat, breathlessness, and myalgia. In vulnerable population such as children, elderly, and in people with comorbidities such as hypertension and diabetes, it can progress to viral pneumonia and they can die of respiratory failure. In a study involving 173 patients with severe disease, 16.2% had diabetes and another study of 140 hospitalized patients, 12% had diabetes.[11-21]

Diabetes and hypertension are important reasons for hospitalization and mortality of COVID-19 infection. Poor glycemic control is a risk factor for serious infections and adverse outcomes. The treatment of hyperglycemia is difficult during fever and in patients with respiratory symptoms. Hence, frequent blood glucose monitoring and change in anti-diabetic drugs may be necessary to achieve good glycemic control. Hence, it is important for both diabetic and hypertensives to strictly adhere to their prescribed medications and follow general COVID preventive measures to avoid COVID-19 infections and related complications.[22]

The government of India had ordered for a nation-wide lockdown from March 25, 2020 to 31 May 2020 in four phases, to contain the spread of coronavirus outbreak in the country. Imposition of lockdown is a vital step in preventing the spread of COVID-19, but in patients of diabetes and hypertension, there could be worsening of symptoms and increase in complications due to various inconveniences like non-availability of drugs, limited resources to implement healthy lifestyle.[23] This study is an effort to analyze the impact of lockdown on diabetic and hypertensive patient compliance and adherence to lifestyle modifications.

Objectives
The aim of the study was to analyze the impact of lockdown on patient compliance and adherence to lifestyle modifications in patients of diabetes or hypertension or both, in the city of Davangere, Karnataka.

MATERIALS AND METHODS
A questionnaire-based prospective observational study was done in the city of Davangere, Karnataka, for 3 months after obtaining consent from patients. Adult patients who have been diagnosed to either diabetes or hypertension or both were identified and their compliance to the treatment and adherence to lifestyle modifications during lockdown period was studied using a questionnaire.

Ethical Approval
The study was conducted after obtaining ethical approval from the Institutional Ethical Committee.

Inclusion Criteria
The following criteria were included in the study:
Subjects more than 18 years of age.
Subjects diagnosed with diabetes mellitus (DM) and/or HTN and are willing to participate.
Subjects with duration of diabetes and/or HTN of at least 1 year.

Exclusion Criteria
The following criteria were excluded from the study:
Subjects with <18 years of age.
Subjects with complications other than DM and HTN.

Statistical Analysis
A prospective observational study was done using questionnaire. Descriptive statistics were used and results were expressed as percentages.

RESULTS
Demographic Details of Subjects
A total of 100 patients with either DM or hypertension or both were enrolled into the present study. Maximum number of the patients were in the age group of 40–60 years. There was male preponderance seen in all the age groups [Table 1].

Clinical Specifications
Among the total subjects, 82% are suffering from the disease for not more than 10 years and the remaining 18% are having the disease for more than 10 years.

Comparing the adherence to medication, before and after lockdown, majority were compliant and adherent to prescribed medication (87%) but many of them could not take the medications regularly during lockdown because of various reasons, among which non-availability of medications stands first, followed by controlling parameters with diet and few had variations in symptoms because of which there was non-adherence seen [Table 2].

Follow-up
The majority of patients could not consult the physician on regular basis (62%), mainly because of lack of transport,
and among those who consulted maximum were on call consultation and very few directly consulted the doctor. In addition, only 56% had monitored their blood sugar and blood pressure regularly, and about 44% did not get their parameters regularly monitored, especially those with rural background as they could not access laboratory services. Among those who monitored, most of them used digital sphygmomanometer and glucometer available at home [Figures 1 and 2].

There were quite a good number of patients (26%) who had experienced complications because of the disease and also medications, among which predominant was increase in frequency of urination, followed by headache, palpitation, giddiness, and syncopal attacks and also signs of hypoglycemia [Figure 3].

During the lockdown, the majority of patients tried to follow the diet advised but 38% could not follow because of various restrictions during the lockdown. Comparing the physical exercises of patients before and after lockdown, most of them preferred to workout outdoor such as walking and cycling and few indoor. However, after lockdown, majority of those who exercised were indoor and a significant number of people did not exercise mainly because of restrictions of lockdown.

Medications of few patients (18%) were changed due to various reasons such as variations in blood pressure and blood sugar, adverse effect older drugs and also due to non-availability of medications during lockdown. Among them, 6% developed experienced adverse effects because of new medication.

In the present study, patients to protect themselves from getting infected with COVID-19 took various measures such as staying at home unless an emergency, they had also taken ayurvedic medications and immune booster drinks to improve their immunity. An important point to note here is significant number of patients (92%) had lots of apprehension of getting infected with COVID-19, chances of going for complications during lockdown, non-availability of medical services, and they also had fear of death due to their comorbidities.

**DISCUSSION**

The present study has shown that lockdown has significantly reduced medication adherence and compliance and there was lack of access for consultation, blood sugar, and blood pressure monitoring. Patients could not follow their diet and physical exercises due to lockdown, in addition to this, some had reported complications and many had disturbed mental health.

COVID-19 is a global pandemic and has caused havoc in the lives of people worldwide especially in vulnerable population such as diabetic, hypertensive, and geriatric age group. To curb rampant spread of COVID-19 infection, national lockdown was inevitable but unpredicted for which many countries were underprepared.

**Table 1:** Distribution of patients according to the age

<table>
<thead>
<tr>
<th>Age in years</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>20–39</td>
<td>14</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>40–59</td>
<td>33</td>
<td>12</td>
<td>45</td>
</tr>
<tr>
<td>60–80</td>
<td>32</td>
<td>5</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td>21</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 2:** Medication adherence

<table>
<thead>
<tr>
<th>Medication adherence</th>
<th>Before lockdown</th>
<th>During lockdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adherents and compliant</td>
<td>87</td>
<td>60</td>
</tr>
<tr>
<td>Not adherent and non-compliant</td>
<td>13</td>
<td>40</td>
</tr>
</tbody>
</table>

**Figure 1:** Patients’ consultation with physician

**Figure 2:** Follow-up of patients

**Figure 3:** Complications of the disease and medications
The disease is more prevalent in the middle-age group and among males but not many have been suffering from the disease for more than 10 years. These demographic parameters observed are consistent with the study conducted by Ghosal et al.[26]. In the present study, comparing adherence and compliance of subjects to prescribed medication before and after lockdown, adherence and compliance to medication has dropped to significant levels during the lockdown because of various reasons, in addition to this subjects could not follow diet and physical exercises advised to them because of the restrictions of lock down, which is similar to studies conducted by Alshareef et al. and Ghosal et al.[23,27].

Among the total subjects studied, majority could not consult physician regularly and among the few who consulted, online consultations were much more compared to direct consultations. During lockdown, there was hindrance noted to blood sugar and blood pressure monitoring also, all these factors together would have impact on the glycemic and blood pressure control. This is consistent with studies conducted by Bannerji et al. and pal et al.[28,29]. In the study conducted by Richardson et al., they have highlighted the importance of regular blood sugar and blood pressure monitoring as hypertensive and diabetics are at higher risk of complications of COVID-19.[30]

Good number of study subjects in the present study had various complications because of the disease and medications which is similar to the Ghosal et al., where they have found a linear relationship between duration of lockdown and complications.[23] However, not many studies have evaluated complications because of the changed medication during lockdown.

Significant number of study subjects had apprehension of getting infected with COVID-19, chances of going for complication, non-availability of medical services and also fear of death due to comorbidities. This observation of emotional component is similar to the implications of the study conducted by Joensson et al. where they have mentioned that perception of being high risk group of COVID-19 and restrictions during the lockdown has an emotional impact on the people with comorbidities.[31] There are many other studies suggesting that psychological health of patients with diabetes and hypertension is adversely affected during the lockdown. Study subjects have tried to take maximum care to protect themselves from getting infected with COVID-19.

All these observations suggest impact of lockdown on daily habits, social, family, work relationships, and also emotional health of study subjects which may worsen their disease process.

Limitations of the Study

Since the study was conducted for shorter duration and there was apprehension about COVID-19 infection, we could not follow-up patients further.

CONCLUSION

The observations in our study emphasize that nationwide lockdown in view of COVID-19 infection has adversely affected life style habits, compliance, and adherence to medication, also the psychological health of patients with diabetes and hypertension, which would further affect their disease process. Thus, our study focuses on the problems encountered by people with non-communicable diseases to maintain their health during lockdown, giving an in sight for the concerned authorities in to take appropriate measures to mitigate such problems in the future.

REFERENCES


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