CORONA VIRUS (COVID-19) STATE EMERGENCY OPERATIONS CENTRE

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GUIDELINES FOR THE MANAGEMENT OF DIABETES MELLITUS DURING COVID-19 PANDEMIC

National Health Mission - Tamil Nadu
# INDEX

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Diabetes Mellitus &amp; COVID-19 Infection - An Introduction</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>Guidelines for Management of Diabetes Mellitus During the COVID Period</td>
<td>2</td>
</tr>
<tr>
<td>3.</td>
<td>Management of Type I Diabetes Mellitus</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>Management of Gestational Diabetes Mellitus</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>Glucometer for Self-Monitoring of Blood Glucose</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>Glucometer for First Time Dm Screening</td>
<td>5</td>
</tr>
<tr>
<td>7.</td>
<td>Blood Sugar Values to be Maintained in Known Dm On Treatment</td>
<td>5</td>
</tr>
<tr>
<td>10.</td>
<td>Guidelines for Treatment of DM in COVID-19 Patients (Hospitalized)</td>
<td>8</td>
</tr>
<tr>
<td>11.</td>
<td>Protocol for Asymptomatic COVID Patients with Dm</td>
<td>9</td>
</tr>
<tr>
<td>12.</td>
<td>Dietary Supplements which can Increase Immunity</td>
<td>9</td>
</tr>
<tr>
<td>13.</td>
<td>Key Recommendations for Management DM Patients in Govt. Health Facilities</td>
<td>10</td>
</tr>
<tr>
<td>14.</td>
<td>Role of Medical Officers</td>
<td>10</td>
</tr>
<tr>
<td>15.</td>
<td>Provision of Drugs</td>
<td>10</td>
</tr>
<tr>
<td>16.</td>
<td>Promotion of Tele-Medicine</td>
<td>11</td>
</tr>
<tr>
<td>17.</td>
<td>Indication of Insulin</td>
<td>11</td>
</tr>
<tr>
<td>18.</td>
<td>Emergency Helpline Number</td>
<td>11</td>
</tr>
<tr>
<td>19.</td>
<td>Protocol for Screening of Diabetes Mellitus</td>
<td>12</td>
</tr>
<tr>
<td>20.</td>
<td>Acknowledgement</td>
<td>14</td>
</tr>
</tbody>
</table>
1. DIABETES MELLITUS & COVID-19 INFECTION – AN INTRODUCTION

• Diabetes Mellitus is a chronic metabolic disorder which can lead to acute or chronic complications, if left untreated. The prevalence of Diabetes mellitus is increasing worldwide and the rural urban divide is becoming narrower too. The prevalence of the disease in India is about 77 million (7.7 crores) in 2019 and is projected to increase to 101 million by 2030. The type, duration and the degree of metabolic control play a significant role in determining the incidence of Diabetes related complications and subsequent organ damage. Thus, this metabolic disorder can be termed as the modern pandemic of this century.

• COVID-19 disease is a new viral disease caused by a novel corona virus called n-SARS CoV- 2 virus. The morbidity and mortality due to this infection is significantly more among people with the immunocompromised and the elderly people and also among those who are with Hypertension, Diabetes, CAD, and Respiratory illness.

• Hence, in the present scenario, we are currently dealing with a twin pandemic of a highly contagious viral infection and a rapidly increasing metabolic disorder, the combination of which could possibly result in a worse outcome.
2. GUIDELINES FOR MANAGEMENT OF DIABETES MELLITUS DURING THE COVID PERIOD

- Patients with Diabetes Mellitus (DM) may be at an increased risk of acquiring COVID-19 infection, especially if they are not under good control, primarily because of their lowered immunity.

- Hence all patients with Diabetes should ensure that they achieve & maintain a good glycaemic control.

- The target blood sugar levels for glycemic control in these patients during this pandemic period can be a Fasting Blood Sugar level of < 120 mgs % and a Post-Prandial Blood Sugar level of < 180 mgs %.

- These patients with Type 2 Diabetes Mellitus should continue their medications- OAHAs/Insulin in the same dosage if their blood sugar levels are under control. If they are uncontrolled, their oral medications have to be increased or they should be switched over to Insulin as per protocol.

- All patients with Diabetes should have nutritious diet plan which helps to boost their immunity. They should follow physical exercise regimens strictly at home, if not able to go out. Yoga should be routinely practiced. They should stop smoking / Alcohol intake and have adequate sleep.

- All patients with Diabetes should take care of their co-morbidities like Hypertension, Dyslipidemia, CAD etc. They should continue their medications without fail and contact their doctor if they are not under control.
• Elderly DM patients particularly above 65 years should take extra care to avoid movement outside their home altogether and those staying indoor should be aware of dehydration in hot weather & also to take immune boosting diet.

• All patients with Diabetes should immediately report to the health care provider, if they have symptoms like cough, fever, vomiting, abdominal pain or SOB. They should have adequate stock of medications like insulin, syringes, oral anti-Diabetic drugs, drugs for co-morbidities, Blood Glucose monitoring strips and glucose powder for use in case of an unexpected hypoglycaemia etc.,

• All patients with Diabetes should necessarily follow universal precautions like mask wearing, physical distancing, frequent hand washing, maintenance of personal hygiene etc.,

• They should be encouraged to download Arogya Setu app and use it for surveillance of COVID-19 infection. They should also be encouraged to use tele-medicine consultation platforms like e-Sanjeevani OPD or any other online medical consultation platform for remote consultation and availing OPD services like receiving opinion, e-prescription etc., without physically attending the hospital.
3. MANAGEMENT OF TYPE I DIABETES MELLITUS

- Patients with Type 1 Diabetes Mellitus should continue Insulin without fail and up-titrated the dosage, if uncontrolled. They should take plenty of fluids to avoid dehydration and check for ketones if they have symptoms like vomiting, abdominal pain or fever.

4. MANAGEMENT OF GESTATIONAL DIABETES MELLITUS

- Patients with Gestational Diabetes Mellitus should check their blood sugars frequently using Self-Monitoring of Blood Glucose (SMBG) and follow diet plan. If still uncontrolled, they should be started on Insulin as per the standard protocol guidelines.

5. GLUCOMETER FOR SELF MONITORING OF BLOOD GLUCOSE

- To be practical in COVID situation, Glucometer can be very well used for monitoring the sugar value in DM.

- Non-Covid DM patients who are not under control need to be closely monitored and the blood sugar tested frequently (weekly once) under the direct supervision & guidance of PHC Medical Officer.

- Patients with diabetes should monitor their blood sugar levels more frequently using Self-Monitoring of Blood Glucose (SMBG) if possible and continue their medications without fail.

- Non-Covid DM patients who are under control can be given 2 months drugs but their blood sugar levels are to be monitored once a month (weekly once if possible) in the nearby HSCs under the supervision of the local PHC Medical Officer.
6. **GLUCOMETER FOR FIRST TIME DM SCREENING**

DM Screening can be done by Checking RBS using Glucometer and the guiding values are presented below:

- **RBS: 140 - 199 mg/dl**
  (can be managed with Diet plan and Life style modification)

- **RBS: >= 200 mg/dl** (OHAs/Insulin should be started)
  Repeat FBS/RBS before starting OHAs/Insulin

7. **BLOOD SUGAR VALUES TO BE MAINTAINED IN KNOWN DM ON TREATMENT**

- **FBS < 140 mg/dl**

- **PPBS < 180 mg/dl**

- **RBS < 200 mg/dl**
8. GUIDELINES FOR TREATMENT OF DM IN COVID-19 PATIENTS (NON-HOSPITALISED)

- Patients with Diabetes who are asymptomatic and under good control can be continued with the same OHAs/Insulin. Patients with Diabetes who are asymptomatic but not under good control should be intensified with OHAs or switched over to Insulin.

- Patients with Diabetes who are symptomatic and under good control should be switched over to Insulin or continued on insulin. Patients with Diabetes who are symptomatic and not under good control should be switched over to Insulin or Insulin treatment intensified.

- It is advisable to avoid drugs like SGLT2 inhibitors & patients on Metformin should be followed up closely to withdraw the drug, if they develop symptoms or any complications.

- GDM patients should be treated with ONLY insulin. Diet rich in Vitamins C & D, Zinc & Proteins should be taken. Physical activity & Yoga should be practiced. Drugs for the treatment of other associated conditions like Hypertension/Dyslipidemia/CAD etc. should be continued.
9. FLOWCHART FOR TREATMENT OF DM IN COVID-19 PATIENTS (NON-HOSPITALISED)

PATIENTS WITH DIABETES

ASYMPTOMATIC

GOOD CONTROL

CONTINUE WITH SAME OHAS / INSULIN

POOR CONTROL

INTENSIFY WITH OHAS OR SWITCH OVER TO INSULIN

SYMPTOMATIC

GOOD CONTROL

SWITCH OVER TO INSULIN OR CONTINUE ON INSULIN

POOR CONTROL

SWITCH OVER TO INSULIN OR INTENSIFY INSULIN
## 10. Guidelines for Treatment of DM in COVID-19 Patients (Hospitalised)

<table>
<thead>
<tr>
<th>Condition of the Patient</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patients on OHA/Insulin</strong></td>
<td><strong>Mild symptoms of COVID + hemodynamically stable + good glycemic control</strong></td>
<td><strong>Patients on OHA/Insulin</strong></td>
<td><strong>Patients with complications (like DKA /HHS) or with co-morbidities</strong></td>
</tr>
<tr>
<td><strong>Diet</strong></td>
<td><strong>Oral feeds</strong></td>
<td><strong>Oral feeds</strong></td>
<td><strong>PT on RT feeds /NPO/oral feeds</strong></td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td><strong>PT on methyl prednisolone /HCQs</strong></td>
<td><strong>PT on methyl prednisolone /HCQs</strong></td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td><strong>Switch all patients to insulin /stop OHA</strong></td>
<td><strong>Switch all patients to insulin /stop OHA</strong></td>
<td><strong>Start the patient on insulin infusion</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Monitor blood sugars every 2-3rd day</strong></td>
<td><strong>Monitor blood sugars daily (2-3 times)</strong></td>
<td><strong>Check CBG hourly initially followed by 2nd hourly</strong></td>
</tr>
<tr>
<td></td>
<td><strong>If patient condition deteriorates, check blood sugars SOS</strong></td>
<td><strong>If patient condition deteriorates, check blood sugars SOS &amp; start on infusion if CBG &gt; 300mg/dL</strong></td>
<td><strong>If fall in blood sugars not satisfactory increase infusion by 4 to 8 units. Give subcutaneous insulin along with infusion for each meal</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Check urine ketones/ABG</strong></td>
<td><strong>Check urine ketones /ABG</strong></td>
</tr>
<tr>
<td><strong>AIM</strong></td>
<td><strong>Maintain FBS &lt; 110mg/dl PPBS/RBS &lt; 140mg/dl</strong></td>
<td><strong>Maintain FBS &lt; 140mg/dl PPBS/RBS &lt; 180mg/dl</strong></td>
<td><strong>Maintain FBS &lt; 180mg/dl PPBS/RBS &lt; 250mg/dl</strong></td>
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</table>
11. PROTOCOL FOR ASYMPTOMATIC COVID PATIENTS WITH DM

<table>
<thead>
<tr>
<th>Diabetic Patients on OHA/Insulin with Good Glycemic Control</th>
<th>Diabetic Patients on OHA with Inadequate Control</th>
<th>Diabetic Patients on Insulin with Inadequate Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continue the Same OHA/Insulin</td>
<td>Step up Dose of OHA or Switch to Insulin</td>
<td>Step up the Dose of Insulin or Start Infusion Based on Values</td>
</tr>
</tbody>
</table>

12. DIETARY SUPPLEMENTS WHICH CAN INCREASE IMMUNITY

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<tr>
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<tbody>
<tr>
<td>Eggs</td>
<td>Liver</td>
<td>Red meat</td>
<td>Fish</td>
<td>Indian Gooseberry</td>
</tr>
<tr>
<td>Milk</td>
<td>Chicken</td>
<td>Cheese</td>
<td>Milk</td>
<td>Lime,</td>
</tr>
<tr>
<td>Spinach</td>
<td>Dark</td>
<td>Nuts</td>
<td>Whole Grains</td>
<td>Orange and</td>
</tr>
<tr>
<td>Milk</td>
<td>Chocolate</td>
<td>Broccoli</td>
<td>Like Wheat, Rice</td>
<td>Lemons</td>
</tr>
<tr>
<td>Almonds</td>
<td>Legumes</td>
<td>Yogurt</td>
<td>Broccoli</td>
<td>Tomatoes</td>
</tr>
<tr>
<td>Curd</td>
<td>Oats</td>
<td>Eggs</td>
<td>Vegetables</td>
<td>Potatoes</td>
</tr>
<tr>
<td></td>
<td>Toor Dhal</td>
<td></td>
<td>Potatoes</td>
<td>Broccoli</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Green Beans</td>
<td>Green and</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Quinoa</td>
<td>Red Peppers</td>
</tr>
</tbody>
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13. KEY RECOMMENDATIONS FOR MANAGEMENT OF DM PATIENTS IN GOVT. HEALTH FACILITIES

Patients should be encouraged to use SMBG at home, which is affordable nowadays, and monitor their BS values. If they are under control, they should continue the same management and if not under control, they should immediately contact their doctor through phone or WhatsApp or Tele-consultation portal etc. for further advise and follow them.

14. ROLE OF MEDICAL OFFICERS

Diabetic patients who are asymptomatic and under good control can be managed in the nearby Govt. healthcare facility like the nearest GH, Urban PHCs etc., itself. Such patients attending the tertiary Govt. Hospitals can be referred to the nearest such Centre, where they can get their monthly drugs and visit the tertiary referral centres only once in 3 months or in between if they are referred by the concerned Medical Officer. The Medical Officers in these centres can be trained in the basic management & referral protocols through online virtual training programs.

15. PROVISION OF DRUGS

In view of COVID-19, well-controlled patients attending tertiary care hospitals can be provided with drugs for 2-3 months which will help reduce the footfall in such centres. Availability of insulin & OHAs universally across all centres has to be ensured, except maybe the newer drugs like Gliptins or SGLT2 inhibitors.
16. PROMOTION OF TELE-MEDICINE

Promotion of tele-medicine facility can be initiated from the tertiary care hospitals to the various peripheral hospitals on weekly/fortnightly/monthly basis which will be very helpful for pregnant patients with DM, Type 1 children & others with complications who are at high risk. The patients can access esanjeevaniopd.in and avail free OPD services. By utilising services through this online platform, Patients can avoid physical movement to meet a doctor.

17. INDICATION OF INSULIN

All Type 2 Diabetic patients with diabetes related complications like Diabetic Nephropathy with CKD, Diabetic Retinopathy with Blindness, Diabetic Neuropathy with DFS, Diabetes related CAD and Cardiomyopathy are indications for human insulin.

18. EMERGENCY HELPLINE NUMBER

An emergency Statewide Helpline number 104 is exclusively available for DM patients and publicized widely so that Diabetic patients can call this control room for guidance in case of emergency.
National Health Mission - Tamil Nadu
National Program for Prevention and Control of Cancer, Diabetes, Cardio Vascular Diseases and Stroke (NPCDCS)
Protocol for Treatment of Type 2 Diabetes

Patient Clinic card: Start and maintain a Patient Clinic Card at the NCD Clinic for all newly detected patients with Diabetes and also for known Diabetic patients already on treatment.

Assessment:
1. Take a detailed History for: Chest pain / Angina / IHD / TIA / Stroke / CCF / Diabetes Mellitus / CKD
2. To do: a) Waist Circumference b) Urine Albumin c) Serum Cholesterol / Lipid profile d) Serum Creatinine e) ECG
3. Refer protocol for management of Comorbid conditions / Complications

Patients with Diabetes already on treatment

If Blood Sugar under control
• Continue the same treatment
  • LSM

Follow the same Protocol for Newly Detected Patients with diabetes

If Blood sugar not under control

Newly Detected Patients with Diabetes

Without complications

Treatment should be initiated with Life Style Modification (LSM) and
T.Metformin 500 mg twice a day after food
(except in patients with nephropathy / Hepatic impairment / Metformin intolerance)

Reasses with FBS & 2 hour PPBS after 1 month and look for Diabetic control goal of FBS < 120 mg / dl and 2 hour PPBS < 180 mg / dl

If adequate control
• Continue LSM
• T.Metformin
• Review every 3 months

If control not adequate

Continue LSM and increase the dose of T.Metformin to a maximum of 1000 mg twice a day if tolerated

Recheck FBS 2 hour PPBS after one month

If adequate control
• Continue LSM
• T.Metformin
• Review every 3 months

If control not adequate

• Continue LSM
• T.Metformin
• Add a Second Drug* (if control not achieved)

Refer to Physician for management

With Chronic Complications such as:
• Foot ulcer
• Seepage
• Nephropathy
• Retinopathy
• Neuropathy etc.

Reasses FBS 2 hour PPBS after 1 month

If control achieved
Maintain the same treatment

If control not achieved
Add inj. Insulin*

With Acute Complications
• Patients with FBS > 250 mg / dl
• Patients with symptoms of uncontrolled blood sugar (Polyuria, Polydipsia and Weight loss) requiring Insulin

Second Drug

T.Glimepride - initiate with 1 mg once daily before food; can be increased to a maximum of 4 mg per day in two divided doses

T.Glipizide - initiate with 5 mg / day before food; can be increased to a maximum of 15 mg per day in two to three divided doses

T.Glibenclamide – initiate with 5 mg / day before food; can be increased to a maximum of 10 mg per day in two divided doses

DPP4 inhibitors - Sitagliptin, Vildagliptin

Note: During treatment watch for symptoms of Hypoglycaemia

* Refer manual for insulin Guidelines
FBS - Fasting Blood Sugar
PPBS- Post Prandial Blood Sugar
LSM - Life style modification
Reference for protocol: ADA Guidelines 2016
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