

CAPAGE

Promoting academic and professional excellence in health care
to meet the challenges of aging in Sri Lanka

Case study: Exercise prescription: Type 2 Diabetes Mellitus



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Case Study: Exercise prescription: DM++

- Mr. Perera 73 year old retired Bank officer from Kandy.
- Diagnosed with type 2 DM 5 years back when he admitted with unstable angina 5 years back.
- He is currently on
 - Metformin and tolbutamide (oral hypoglycemic agents)
 - Captopril (antihypertensive)
 - Statin (lipid lowering agent)
- Past medical history
 - He is a hypertensive patient for 10 years.
 - He has dyslipidaemia.
- Physical examination findings:
 - HR= 84bpm
 - BP= 130/80mmHg
 - Ht= 178 cm wt=104kg
 - Moderate peripheral neuropathy
 - Pre proliferative retinopathy
 - Foot inspection – normal
- Investigations:
 - FBS 146mg/dl
 - HbA1c 8.8% (4-6%)
 - Lipid profile
 - Total cholesterol 240mg/dl
 - LDL 160mg/dl
 - HDL 30 mg/dl
 - Urine Microalbumin +

Question

- **State the facts that need to be considered when prescribing an exercise program for Mr.Perera and his clinical implications**
- **As a clinical exercise professional how would you advice Mr. Perera on an exercise program**

Answer:

- **Medical complications identified**
 1. **Moderate diabetic neuropathy**
 2. **Higher resting heart rate ? Autonomic neuropathy**
 3. **Early retinopathy**
 4. **Early nephropathy**
 5. **Past history of acute coronary syndrome and By pass surgery**
 6. **Current diabetic control- Last FBS/PPBS/HbA1c**
- **current diabetes Rx and meal plan**
 - **OHGs**
- **Identify goals**
 - **Lose weight**
 - **Improve body composition**
 - **Improve body glucose levels**
 - **Reduce the risk of another cardio vascular event**
- **Assess the current physical activities of the patient.**

- (e.g He may enjoy cycling, he may be having a sedentary life style etc.)

Physical activity guideline for older adults (ACSM recommendation...)

- Adults can do /cannot do 150 min / week
 - Do PA according to their abilities & conditions
- Balance exercise
 - Older adults should do balance exercise to prevent from falling
- Chronic Conditions
 - Always maintain safety
- Only use relative intensity to determine level of effort
- Exercise prescription should carry FITT
 - **Mode/ Type**- type of physical activity- may depend on patient's interests and desired goals of exercise
 - E.g. Caloric expenditure
 - **Intensity**- moderate or low intensity
 - **Frequency** – 3 to 5 days per week
 - **Duration and rate of progression**
 - **Timing**

Exercise prescriptions- Aerobic

- **Mode**- Walking/ Cycling/Swimming
- **Intensity**- 50-75% of maximal aerobic capacity
- **Frequency**- 3-5 per week/ most of the days
- **Duration**- 20-60 minutes (increase over time)
- **Progression**- rate of progression depends on baseline fitness, age, weight, health status etc.

Best approach is to increase the duration rather than intensity

Exercise prescriptions- Resistance

- **Mode** - Free weights, machines, elastic bands
- **Intensity** - **50** - 60% of 1 RM
- **Frequency** - At least two times per week, but never on consecutive days
- **Duration** - 10-15 repetitions per set, one to two sets per type of specific exercise
- **Progression** - as tolerated

Exercise prescriptions- ROM

- **Mode** - static stretching
- **Frequency** - Post aerobic exercise session
- **Duration** - 10 to 30s per exercise of each muscle group
- **Progression** – as tolerated

Exercise program includes;

1. Warm up period: 5-10 mins of low intensity aerobic exercise (walking/ cycling)
2. Period of intense exercise
3. Cool down period: 5-10 mins similar activities to warm up
4. Plan to increase intensity or duration over time
5. Specify duration and frequency per week

Special considerations

1. **Avoid** exercise during **peak insulin action time**.

Case study: Exercise prescription: DM++

2. **Warm up and cool down**
3. Do exercise **1-3 hrs after a meal**
4. Avoid exercise just before bed dtime (night time hypoglycaemia)
5. Assess for **proper footwear** and inspect feet daily
6. **Avoid** extreme **environment temperatures**
7. **Avoid** exercise when blood **sugar control is poor**
8. Instruct the patient on **blood glucose monitoring** and to follow guidelines to prevent hyper and hypoglycemic events
9. Have a snack ready for an emergency
10. Exercise with family or friend whenever possible

Follow up-

- Follow up the patient
- Reinforce
- Appreciate the improvements and encourage to continue the exercise program.
- If any deterioration of the medical condition , necessary referral .