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Application of Telemedicine in the Management of Cardiovascular Diseases

5.1 Rationale of use of telemedicine

The care of patients at risk and or with Cardiovascular Diseases (CVDs) require lifelong adherence to treatment and behavioural change for risk management, and decreasing morbidity and premature deaths. It also requires periodic assessment of risk status, monitoring of complications, adherence to treatment and treatment revisions if required to optimize the risk management. The lifelong adherence to evidence-based treatment and practice of healthy lifestyle is important and that requires patient empowerment, and easy access to quality health care services.

There are several barriers for optimum care (availability, accessibility, affordability of health care services). The primary and secondary care level hospitals need to be strengthened in their capacity to provide all the required care to patients with CVD, due to lack of knowledge, skills, competence and limited available diagnostic tools. These centres will often need access to expert advice from tertiary care centres, which are predominantly located in major cities. Thus, access to healthcare services is important in ensuring continuum of care. Technology-based access to decision support system through telemedicine is an alternative means of providing healthcare services to patients, healthcare providers at primary and secondary care level hospitals, at government and in private sector. Telemedicine is one of the solutions to deal with the healthcare needs of patients with CVD in resource strained countries.

5.2 Goals of telemedicine

To reduce morbidity and mortality in patients at risk and or with established CVD by ensuring uninterrupted access to health care services using teleconsultations, complementing with conventional form of face-to-face health care services.

5.3 Scope and purpose of guidelines

The scope of the guidelines is to provide teleconsultations to patients at risk and with established CVD to promote self-care support, and health care providers for decision support for guiding evidence-based evaluation, risk stratification, treatment, follow-up and monitoring for complications, treatment revisions and timely referral to tertiary

care centres. The main purpose of developing guidelines for telemedicine is to ensure easy access to health care services by experts in the field, and for providing guidance to stakeholders for optimization of evidence-based care.

5.4 Aim

To enhance access to health care services at community level to reduce morbidity and mortality due to CVD

5.5 Objectives

The objectives of teleconsultations are to improve control of risk factors and prevention of cardiovascular events by facilitating access to expert health care services through teleconsultations at primary health care setup.

5.6 Role of teleconsultations in care of patients at risk and established CVD and during cardiac emergency

5.6.1 Primary prevention

Telemedicine services could play an important role in primary prevention of CVD for -

Patient level consultation- Patients with diagnosed hypertension, diabetes and or dyslipidemia on treatment, under follow-up could seek consultation directly for the following reasons -

- Continuation of medication
- Titration of dose based on results of the risk factors levels
- Guidance for practice of healthy lifestyle, diet, exercise
- Understanding warning signs of impending cardiovascular events and symptoms of CVD

Healthcare providers- Health care providers attending patients at primary and secondary care setting could access teleconsultations services seeking guidance for the following reasons-

- Evidence based evaluation of patients with hypertension, diabetes, and or dyslipidemia
- Risk stratification
- Use of evidence-based treatment
- Monitoring of risk factors for target goals
- Follow-up evaluation for risk control, CVD/events
- Guidance for need for referrals

Specialized consultation- Specialized teleconsultations services could be accessed by health care providers working at primary and secondary health care centres, private clinics and or nursing homes. The following stakeholders could seek guidance through teleconsultations services;

- General practitioners
- Specialist working in private clinics, nursing homes, primary and secondary care centres in government sector.

5.6.2 Established Coronary Artery Disease (CAD)

Telemedicine services would be accessed by stakeholders for management of patients with established CAD for the following -

- **Risk evaluation and risk stratification**

- Evidence based management planning
- Follow-up monitoring for risk management, detection of complications and treatment revision
- Drug continuation
- Management of CAD patients with complications (eg: heart failure, worsening angina) and comorbidities (eg: Chronic Kidney Disease (CKD) , diabetes) during follow-up, for -
 - Selection of drugs
 - Dose titration based on renal function, potassium level, blood pressure (BP) and heart rate (HR)
- Decision of referral to tertiary care centre for assessment of-
 - Extent and severity of CAD
 - Evaluation of left ventricular (LV) function and risk stratification of sudden cardiac death in post-acute coronary syndrome patients
- Guidance for need of referral to tertiary care centre.
 - Patients presenting first time with symptoms of angina (CAD)
 - Patients with CAD with past history of Acute Coronary Syndrome (ACS) not evaluated for LV function and risk for sudden cardiac death status
 - Patients with CAD with worsening angina and or symptoms of heart failure
 - Patients with CAD with CKD

- **Cardiac Emergencies**

In the case of patients with cardiac emergencies (acute coronary syndrome, acute heart failure, arrhythmias), health care providers at primary, secondary care hospitals in government and private sectors could access teleconsultations for the following reasons,

- Assisting in making diagnosis using clinical data, ECG tracing, lab results through any software/app-based technology
- Providing guidance by experts at tertiary care centres in delivering emergency care to stabilize patients hemodynamically before referral

5.7 Clinical support tools

Each primary and secondary health care centre both in government and private sectors seeking teleconsultations should have following clinical support tools for effective implementation of treatment guided through teleconsultations -

- Biochemistry lab facilities for estimation of -
 - lipid profile, blood glucose, renal function, electrolytes, haemoglobin and INR testing
 - Point of care devices for estimation of glucose, Troponin T/I
- ECG machine
- Weighing Machine
- BP instrument
- X-Ray chest
- Defibrillators with ECG monitor
- 24*7 helpline should be available at tertiary care centres by forming an App based group of experts to be available for providing teleconsultations services round the clock through app-based technology.
- Drugs used for treating hypertension, diabetes, dyslipidemia, heart failure, thrombolytic agents, antiplatelets, heparin, oral anticoagulants and oxygen supply should be available at secondary care hospitals and nursing homes/clinics

5.8 Skill building for the providers

Telemedicine could be used for capacity building of health care providers to enhance knowledge and skills for management of patients with CVDs.

- The knowledge and skills of health care providers would be enhanced by -

- Providing teleconsultations on given real case scenario in terms of processes of evaluation, diagnosis, risk stratification, evidence-based management planning and follow-up monitoring of patients.
- The webinar-based platform could be used for continuing medical education (CME) of the health care providers by structuring the schedule of CMEs in an annual calendar.

5.9 Empowering the patients

The services of teleconsultations could be used for empowering patients at risk and / or with CVD for the following -

- Educating patients with established CVDs about their disease, risk factors, potential complications and preventive measures -
 - To support self-management, and self-monitoring of risk factors and complications
 - To improve adherence to medication, practice of healthy lifestyle and follow-up visits
- Educating patients at risk of developing CVD about -
 - Risk factors of developing high BP, diabetes, dyslipidemia and obesity
 - Importance of practice of daily physical activity
 - Making choices for healthy and unhealthy foods including salt and saturated fats
 - Monitoring of body weight, BMI
 - Risks of tobacco consumption and harmful consumption of alcohol and sugary beverages
 - Importance of periodic monitoring of BP, glucose and lipid levels and body weight
 - Symptoms of CAD, ACS and importance of immediate seeking of medical attention in an event of symptoms of ACS

Patients at risk and established patients of CAD could seek teleconsultations through mobile phone or using e- Sanjeevani clinic portal.

5.10 Challenges

There are challenges in providing telemedicine services to wider audience due to

- Limited availability of experts in the concerned field of NCDs
- Issues related to availability and speed of internet connectivity

- Confidence of patients in seeking teleconsultations services
- Confidentiality of health data of patients and associated ethical issues
- Reliability of inputs of clinical data provided by the health care providers to make a treatment decision
- Lack of availability of clinical tools required at primary health care setup for making treatment decisions
- Non-availability of medicines required for treatment at primary health care setup