2020 ESC GUIDELINES FOR THE MANAGEMENT OF ACUTE CORONARY SYNDROMES IN PATIENTS PRESENTING WITHOUT PERSISTENT ST-SEGMENT ELEVATION

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5 CONTENT (CONT.)

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  - Diagnostic (Cont.)
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      - Confounders of cardiac troponin concentration
      - Practical guidance on how to implement the European Society of Cardiology 0 h/1 h algorithm
      - Avoiding misunderstandings: time to decision = time of blood drawn-around time
    - Non-invasive imaging
      - Functional evaluation
      - Anatomical evaluation
  - Differential diagnosis

DEFINITIONS

Chapter 2.1

7 DEFINITIONS

- ACS's Clinical Presentation is broad:
  - Cardiac arrest
  - Electrical or haemodynamic instability with cardiogenic shock
    - Ongoing ischaemia
    - Mechanical complications
      - Severe mitral regurgitation
  - Pain-free Patient (at the time of presentation)

8 DEFINITIONS (CONT.)

- The leading symptom with suspected ACS is acute chest discomfort

    - Pain

    - Pressure

    - Tightness

    - Burning

    - Chest pain-equivalent symptoms

        - Dyspnoea

        - Epigastric pain

        - Pain in the left arm.

9 DEFINITIONS (CONT.)

- Based on the ECG, two groups of patients should be differentiated:
  - Patients with acute chest pain and persistent (>20 min) ST-segment elevation.
  - Patients with acute chest discomfort but no persistent ST-segment elevation
    - non-ST-segment elevation ACS (NSTEACS)

10 DEFINITIONS (CONT.)

- Patients with acute chest pain and persistent (>20 min) ST-segment elevation

  - It termed ST-segment elevation ACS

  - Generally reflects an acute total or subtotal coronary occlusion

  - Most patients will ultimately develop ST-segment elevation myocardial infarction (STEMI)

  - The mainstay of treatment:

    - Immediate reperfusion (PCI)

    - Fibrinolytic therapy (if not available in a timely manner)

11 DEFINITIONS (CONT.)

- Patients with acute chest discomfort but no persistent ST-segment elevation [non-ST-segment elevation ACS (NSTEACS)]
  - ECG changes that may include
    - Transient ST-segment elevation
    - Persistent ST-segment depression
    - Transient ST-segment depression
    - T-wave inversion,
    - Flat T waves,
    - Pseudonormalization of T waves
    - Normal ECG

12 DEFINITIONS (CONT.)

- Pathological correlate at the myocardial level
  - Cardiomyocyte necrosis [non-ST-segment elevation myocardial infarction (NSTEMI)]
  - Myocardial ischaemia without cell damage (unstable angina) (Less frequnet).

13 DEFINITIONS (CONT.)

- A small proportion of patients may present with ongoing myocardial ischaemia (characterized by one or more of):
  - Recurrent or ongoing chest pain
  - Marked ST-segment depression on 12-lead ECG
  - Heart failure
  - Haemodynamic instability
  - Electrical instability

14 DEFINITIONS (CONT.)

- Amount of myocardium in jeopardy and the risk of developing CS and/or malignant ventricular arrhythmias indicates:

  - Immediate coronary angiography

  - Revascularization (if appropriate)

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UNIVERSAL DEFINITION OF MYOCARDIAL INFARCTION

Chapter 2.1.1

16 UNIVERSAL DEFINITION OF MYOCARDIAL INFARCTION

- Acute myocardial infarction (AMI) defines cardiomyocyte necrosis in a clinical setting consistent with acute myocardial ischaemia

- Combination of criteria is required to meet the diagnosis of AMI
  - Detection of an increase and/or decrease of a cardiac biomarker
  - Preferably high-sensitivity cardiac troponin (hs-c Tn) T or I, with at least one value above the 99_{th} percentile of the upper reference limit and at least one of
    - Symptoms of myocardial ischaemia
    - New ischaemic ECG changes
    - Development of pathological Q-waves on ECG.
    - Imaging evidence of loss of viable myocardium or new regional wall motion abnormality in a pattern consistent with an ischaemic aetiology.
    - Intracoronary thrombus detected on angiography or autopsy.

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TYPES OF MYOCARDIAL INFARCTION

Chapter 2.1.1.1 – Chapter 2.1.1.3

18 TYPE 1 MYOCARDIAL INFARCTION

- Characteristics by Atherosclerotic plaque
    - Rupture
    - Ulceration
    - Fissure
    - Erosion
- Resulting
    - Intraluminal thrombus in one or more coronary arteries
    - Leading to decreased myocardial blood flow
    - Distal embolization
    - Subsequent myocardial necrosis

19 TYPE 1 MYOCARDIAL INFARCTION (CONT.)

- Patient may have
  - Underlying severe coronary artery disease (CAD)
  - Non-obstructive coronary atherosclerosis (5-10%)
  - No angiographic evidence of CAD (particularly in women)

20 TYPE 2 MYOCARDIAL INFARCTION

- Myocardial necrosis in

  - Other than coronary plaque instability

  - Causes an imbalance between myocardial oxygen supply and demand

TYPE 2 MYOCARDIAL INFARCTION (CONT.)

- Mechanisms
  - Hypotension
  - Hypertension
  - Tachyarrhythmias
  - Bradyarrhythmias
  - Anaemia
  - Hypoxaemia
  - Coronary artery spasm
  - Spontaneous coronary artery dissection (SCAD)
  - Coronary embolism
  - Coronary microvascular dysfunction

22 TYPES 3-5 MYOCARDIAL INFARCTION

- Type 3 MI
  - Resulting in death when biomarkers are not available

- Types 4 MI
  - Related to PCI

- Types 5 MI
  - Related to coronary artery bypass grafting (CABG)

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UNSTABLE ANGINA IN THE ERA OF HIGH-SENSITIVITY CARDIAC TROPONIN ASSAYS

Chapter 2.1.2

24 UNSTABLE ANGINA IN THE ERA OF HIGH-SENSITIVITY CARDIAC TROPONIN ASSAYS

- Definition:
  - Myocardial ischaemia at rest
  - On minimal exertion in the absence of acute cardiomyocyte injury/necrosis

25   UNSTABLE ANGINA IN THE ERA OF HIGH-SENSITIVITY CARDIAC TROPONIN ASSAYS (CONT.)

- Among unselected patients presenting to the emergency department with suspected NSTE-ACS, the introduction of hs-cTn measurements in place of standard troponin assays resulted in an increase in the detection of MI (4% absolute and 20% relative increases) and a reciprocal decrease in the diagnosis of unstable angina

- Compared with NSTEMI patients' individuals with unstable angina do not experience acute cardiomyocyte injury/necrosis, have a substantially lower risk of death, and appear to derive less benefit from intensified antiplatelet therapy, as well as an invasive strategy within 72 h

EPIDEMIOLOGY

Chapter 2.2

EPIDEMIOLOGY

- The proportion of patients with NSTEMI in MI surveys increased from one third in 1995 to more than half in 2015
  - Mainly accounted for by a refinement in the operational diagnosis of NSTEMI

- Opposed to STEMI:
  - No significant changes are observed in the baseline characteristics of the NSTEMI population with respect to age and smoking, while diabetes, hypertension, and obesity increased substantially

28 EPIDEMIOLOGY_(CONT.)

- Early angiography (<_72 h from admission)
  - Increased from 9% in 1995 to 60% in 2015
    - Adjusted odds ratio (OR) 16.4, 95% confidence interval (CI) 12.0 22.4, P<0.001

- PCI during the initial hospital stay
  - Increased from 12.5% to 67%.

29 EPIDEMIOLOGY(CONT.)

- Main consequences are
  - Reduction in 6-month mortality from 17.2% to 6.3%
  - Adjusted hazard ratio (HR) decreased to 0.40 (95% CI 0.300.54) in 2010, remaining stable at 0.40 (0.300.52) in 2015