Angina and heart attack MYOCARDIAL INFARCTION – MI

Definitions

Angina
Pain or discomfort in the chest due to reduced blood and oxygen flow to the heart.

Myocardial Infarction (MI)
Damage or death to an area of the heart muscle resulting from a reduced or blocked blood supply. (Also known as a coronary thrombosis or heart attack).

Angina is a condition usually caused by the build up of a cholesterol plaque on the inner lining of the coronary arteries. Cholesterol is a fatty chemical which is part of the outer lining of cells in the body, and a cholesterol plaque is a hard, thick substance caused by deposits of cholesterol on the artery wall. Over time, the build up of the plaque causes narrowing and hardening of the arteries, and this significantly reduces the blood flow to the heart muscle. When a person is resting the heart is beating at its resting rate; when any type of exertion is undertaken the heart is required to beat more strongly and at a faster rate to ensure that an adequate supply of oxygenated blood is being circulated. This is a case of 'supply and demand', and the more exertion, the more cardiac effort is required, and the more oxygen the heart will need.

When the coronary arteries are narrowed less blood can be supplied to the heart muscle, so a situation will be reached where the demand of the heart muscle for blood will exceed that which the coronary arteries can supply. The heart muscle will therefore be deprived of oxygen and 'cramps', producing pain.

Typically, an angina attack occurs with exertion, and subsides with rest. If the narrowing of an artery reaches a critical level, angina can occur at rest (unstable angina).

A person with angina, especially 'unstable angina' has a high risk of suffering a heart attack in the future.

Myocardial Infarction is the medical term for a heart attack. It is caused by a complete blockage of one of the coronary arteries, which results in the area of the heart supplied by that vessel becoming completely deprived of its blood supply causing the affected area to die. The usual cause of this is either for a clot (thrombus) to form on the wall of the blood vessel or for a plaque to rupture and cause a blockage. If the blockage occurs in a vessel supplying a large area of the heart then it is unlikely to be able to function normally and a cardiac arrest will result. If the area supplied is relatively small then it may be possible for the rest of the heart to compensate and normal cardiac function may be re-established.

Possible signs and symptoms

The symptoms of angina can be variable depending on the severity of the coronary disease, and can also be triggered by emotionally stressful situations which also increase the heart rate (supply and demand). However, on rest, the heart rate will slow down again and the symptoms should pass within approximately 5-10 minutes. Use of a glyceryl tri-nitrate (G.T.N.) spray will help to relieve the symptoms. If the symptoms persist despite rest and the use of G.T.N. spray the diagnosis should be reconsidered as it is likely that the casualty is having a myocardial infarction.

The signs and symptoms of a myocardial infarction can also be variable and it is important to remember that 30% of heart attacks are 'silent' as they produce no obvious symptoms. A heart attack can happen at any time, including during rest. The pain is similar to that of angina, but is often more severe. Unlike angina, the symptoms of MI will not be relieved by the use of the G.T.N. spray. If the symptoms last longer than 10 minutes the casualty is probably experiencing a heart attack.

Angina

- Crushing, vice-like pain, usually in the central area of the chest, can radiate to the left arm, neck or jaw
- Breathlessness
- Sweating/Pallor
- Regular, fast pulse
- Anxiety

Myocardial Infarction

- Crushing, vice-like pain in the centre of the chest, possibly radiating to the left arm, neck or jaw. Can sometimes be described as indigestion. 30% of casualties experience no pain.
- Breathlessness
- Sweating/Pallor
- Irregular pulse, often missing beats
- Nausea
- Anxiety
- Light-headedness
- Collapse

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Management

Angina
Sit the casualty upright and allow them to lean slightly forward as this makes it easier to breath. The dental chair in its upright position is ideal, otherwise it is best to sit them on the floor with their back to a wall. Under no circumstances insist that the person lies flat as this will not help with breathing and will put the heart under more pressure.

High flow oxygen must be administered via the non-rebreathing mask and if the casualty carries their own glyceryl tri-nitrate (G.T.N.) spray they should be encouraged to use it by delivering 1-2 sprays sublingually. If they do not have their medication, or if it is out of date, then use your own supply from the drug box in the same way. The G.T.N. spray works by causing the blood vessels to dilate which will increase the blood flow to the heart.

If the pain does not reduce despite the G.T.N., then a myocardial infarction should be suspected and the paramedics must be called. A person who has angina will be familiar with their own condition and will tell you what is 'normal' for them during an attack.
If the symptoms are worse than normal or less responsive to treatment, then immediate transfer to hospital is required. If you are worried it is also a good idea to make the call, even if it is just for reassurance. Otherwise, once the symptoms have improved it is best to allow the casualty to rest before going home, as the G.T.N. will also have increased the blood flow to other organs and can result in a painful headache. Because of this, and the fact that they have just experienced an angina attack, it is best to arrange for someone to collect them if they have attended the appointment alone.

Myocardial
Infarction Early recognition is very important because the casualty needs to be transferred to a coronary care unit as soon as possible, so telephone for an ambulance immediately if it hasn't been done already. The casualty should be placed in the upright position as mentioned earlier and high flow oxygen administered via the non-rebreathing face mask. It may also be beneficial to administer dispersible aspirin. Make sure that the casualty is not allergic to aspirin and not already taking 'anti-coagulant' drugs (such as Warfarin). If this is the case, allowing them to slowly chew a dispersible aspirin may help. However, it is still important to telephone for a paramedic immediately, and if you are unsure you can ask for advice.

Aspirin reduces the clotting ability of the blood, and chewing the tablet instead of swallowing whole allows the drug to be absorbed quickly into the bloodstream through the buccal sulcus. Ensure, therefore, that you have dispersible aspirin. The ideal dose is 300mg, although any strength will do.

If the casualty becomes unconscious then the airway must be opened and the breathing checked. If they are breathing then they must be placed into the recovery position as they are likely to vomit. Continue giving high flow oxygen via the non-rebreathing mask. Monitor the casualty constantly (ABCDE) and if at any time the breathing stops, the rate becomes abnormal, or you are unsure, then start CPR immediately.