

# HIGH CHOLESTEROL

## Cholesterol

Cholesterol is a type of fat produced by the liver. It is present in all human cells and forms part of the cell membrane. Cholesterol is also a constituent of various hormones in the body.<sup>1</sup>

Cholesterol is carried through the blood by lipoproteins:

- **Low-density lipoprotein cholesterol (LDL-C)**
  - ▷ Also known as ‘bad’ cholesterol
  - ▷ Has a higher ratio of fat to protein
  - ▷ LDL-C can cause fatty deposits on the inside of artery walls, known as plaques, which narrow arteries making them less flexible (atherosclerosis).<sup>2</sup>
- **High-density lipoprotein cholesterol (HDL-C)**
  - ▷ Also known as ‘good’ cholesterol.
  - ▷ Higher ratio of protein to fat.
  - ▷ HDL-C helps carry excess cholesterol away from the blood.<sup>2</sup>

Triglycerides (TGs) are the most common type of fat in the blood.<sup>2</sup> Excess TGs are transported to fat cells for storage.<sup>3</sup> It has recently been recognized that substantial amounts of cholesterol are carried along with TG in triglyceride rich lipoproteins (TRLs) and that this also causes atherosclerosis.<sup>4</sup>

## Dyslipidaemia and hypercholesterolaemia

Dyslipidaemia refers to an imbalance of fats in the blood, specifically elevated LDL-C and TGs, and reduced levels of HDL-C.<sup>5</sup> Hypercholesterolaemia refers to high levels of cholesterol.<sup>6</sup>

## QUICK FACTS

- Treatments that lower LDL-C and TGs and raise HDL-C are important
- Lifestyle changes and physical activity can play an important part in treatment<sup>8</sup>
- Statins may be used to help reduce cholesterol if lifestyle changes are not enough<sup>8</sup>
- Many patients do not achieve their lipid targets<sup>11</sup> and persistence with statins can be poor<sup>13</sup>

## Symptoms and diagnosis

Dyslipidaemia and hypercholesterolaemia have few clinical symptoms but are major risk factors in the development of cardiovascular disease.<sup>5</sup> CVD is the world's biggest killer, being the cause of 30% of all deaths.<sup>7</sup>

Dyslipidaemia is diagnosed by a blood test that measures the levels of total cholesterol, LDL-C, HDL-C and TGs in the blood.<sup>5</sup>

## Treatment

The goal of treatment of dyslipidaemia and hypercholesterolaemia is to normalise blood lipids.

### Lifestyle

Lifestyle changes, such as dietary changes to minimise intake of fat, saturated fat and cholesterol, and increasing physical activity, play an important part in treatment.<sup>8</sup>

But for some people lifestyle changes are not enough to reduce cholesterol. In such cases, the most commonly used drugs are statins.<sup>8</sup> Other drugs that may be used include bile acid sequestering resins, cholesterol absorption inhibitors, fibrates and nicotinic acid.<sup>8</sup>

### Statins

Statins (or HMG-CoA reductase inhibitors) regulate the level of cholesterol in the body by:

- Blocking the enzyme that produces cholesterol in the liver.
- Helping lower LDL-C and TGs.
- Mildly assisting in raising HDL-C.

### Treatment targets

These depend on the patient but most doctors recommend an LDL-C less than 2.5mmol/L or TC less than 4.0mmol/L, however some patients should aim for even lower concentrations..<sup>9</sup>

### Side effects

Side effects associated with currently available statins may impact compliance, which may also affect patients reaching their treatment targets. Common side effects associated with statins include muscle aches and pains (now often known as statin-associated muscle symptoms (SAMS)), headaches, and abdominal symptoms. These symptoms are common in patients not taking statins, but the perception of an association with statins may be enough to discourage the patients from taking the tablets.<sup>10</sup> There are other, rarer, adverse events, that have been associated with the use of statins such as the risk of developing diabetes or developing cognitive dysfunction, but the causality is disputed for some of them, and the known benefits of statin therapy are considered to outweigh the small risks of the others.<sup>10</sup>

### Combination therapy

For patients who do not achieve a lower LDL-C on statins alone, combination therapy may be considered as a secondary form of treatment. This includes the use of a statin in combination with ezetimibe or a PCSK9 inhibitor.<sup>9</sup> There is some controversy about the best way to treat hypertriglyceridaemia in order to reduce cardiovascular events.

Lifestyle advice and statin therapy have delivered healthcare benefits, however, many patients do not reach their treatment targets<sup>12</sup> and persistence can be poor with statins.<sup>13</sup>

## References

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