Abbreviations: BMI, body mass index; WHO, world health organization.

Introduction

Obesity and gallbladder disease

Obesity is a health disease which may be reason to cause so many diseases and one of them is gallstone formation in gallbladder (Cholelithiasis).1,2 Humans with higher body mass index (BMI) are at highest risk to have gallstones in their gallbladder particularly in women.3 According to WHO overweight and obesity is considered when BMI (body mass index) is more than 30 kg/m².4 Obesity may cause due to high consumption of sugar, soft drinks, fatty stuffs, fast food, poor eating habits, no walk, and tired lifestyle.1 Gallbladder is a small organ located in the upper right part of the abdomen. The function of gallbladder is to store bile; where bile is a fluid which is produced by the liver for the breakdown of fat which further used for energy. Gallstones are generally made of cholesterol and formed when there is a disproportion between the substances producing bile. Cholesterol gallstones comprise 80% of stones in the Western world.6 Healthy weight management is needed to avoid gallstones formation.

Causes of gallstones formation

Cholesterol plays a tragic role in the formation of gallstone, so it is recommended to cut down on foods having high saturated fat contents like biscuits, butter, cheese and fatty cuts of meat.7 Diet is important factor as the intake of high energy; cholesterol, polyunsaturated fat, and fiber affect the cholesterol saturation of bile. Bile saturation may cause gallstones formation.8 Risk of gallstone formation may increase with increasing age.9 The commonness of gallstones is found to be higher in women than in men. It is supposed that the cause for this gender difference is hormonal. During pregnancy serum estrogen increases which may enhance biliary cholesterol saturation which causes increased progesterone which in turn may lead to inhibition of the contraction of the gallbladder.10 Findings also showed that diabetic patients have more gallstone formation chances than non diabetic patients.11,12 Poor lifestyle (smoking, alcohol, medication used, sports and walk) is also one of the main causes of gallstones formation.13

Liaison between obesity and gallstones formation

Obesity is a momentous risk factor for Cholelithiasis, especially in women. Various studies have confirmed that overweight women with BMI greater than or equal to 30 kg/m² have more chances of gallstones formation in gallbladder. Hypersecretion of cholesterol (associated with obesity) is a chief pathogenic factor. Gallstone disease has also been linked with the local distribution of fat. High central adiposity has been absolutely correlated with risk of gallstone disease. Increased dynamic and energetic physical activity and frivolous activity appear to reduce gallstone formation risk.14 Gallstone disease may also be found among those people who experience speedy weight loss by using low caloric diets. Gallstone formation may be complicated on acting upon voluntary weight loss plans. In such cases, cholesterol which is activated from adipose tissue is secreted into the bile which
leads to supersaturation of cholesterol and diminishes gallbladder contraction. Fluctuation of weight may also be a risk factor of gallstones formation. The relation how obesity leads to gallstones formation is given in Figure 2.

**Figure 2** Effect of Obesity on Gallstones Formation.

**How to control obesity and gallstones formation?**

Vegetarian diet may reduce the risk of emergent gallstones. Vegetarians have an appreciably lower risk of developing gallstones as compared to people who eat meat. A diet low in fat and high in fiber may lead to lower risk of gallstone formation. Fruits and vegetables may care for people from developing gallstones. Control of bodyweight may also help in preventing the development of gallstones. Conversely, hurtle dieting and rapid loss of weight may increase the risk of gallstones formation; so temperance is advised. Physical activity and yoga is the most important and effective therapy for both obesity control and hence lowering gallstones risk.

The relationship between diet and exercise is appeared to be most easiest way to control obesity and hence different diseases including gallstones formation. Healthy life style may greatly affect obesity control and reduces the risk of gallstones formation. Socialization, involvements with friends, healthy enjoyable activities and sports may lead to achieve a healthy lifestyle. Consulting a good physician who can treat by healthy means of natural and artistic ways may help to prevent obesity as well as gallstones formation. Different ways to avoid obesity and hence gallstones formation in gallbladder are given in Figure 3.

**Figure 3** Ways to Reduce Obesity and Gallstones Formation.

**Conclusion**

It is concluded that gallstones formation in gallbladder is related to obesity. Cholesterol levels are increased at higher body fat levels which is too dangerous to contribute to gallstones development. It is terrifically vital to treat obesity brusquely in order to control so many diseases including gallstones. Use of healthy diet having fruits and vegetables, vigorous exercises, use of water and natural drinks and healthy friendly lifestyle may help in obesity control as well as in lowering gallstones risk.

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Conflicts of interest

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