Oliver, 52, an architect, has applied for life and disability insurance. Five years ago he was diagnosed with type 2 diabetes (diabetes). Because he had a mildly abnormal liver blood test, his doctor advised an abdominal ultrasound, which showed a fatty liver. A liver biopsy was performed, which revealed fat and mild-moderate inflammation, but no fibrosis.

Sarah, 44, a real estate agent, is moderately overweight. A CT scan performed two years ago because of abdominal pain was negative other than for a fatty liver. She does not overuse alcohol, and her liver blood tests have been persistently normal. She is applying for life and disability insurance.

Hypothetical Underwriting Outcomes:

Oliver has diabetes and a fatty liver with inflammation and a persistently elevated liver blood test, but no fibrosis. He would be rated for his life policy for his diabetes with a modest additional rating for his inflammatory fatty liver disease. A disability insurance policy could be offered with a modest rating, limited benefit period due to the diabetes, and a liver rider due to the liver disease.

Sarah has no signs of inflammatory liver disease, only a fatty liver that was incidentally found. She could be offered a life policy with a Preferred rating and a disability insurance policy with a Standard rating.

Definition and Causes

Fatty liver disease is a condition in which excess fat builds up in the liver. At its earliest stage, this is called steatosis. There are two main types of fatty liver disease: non-alcoholic (NAFLD) and alcoholic. This article addresses only non-alcoholic fatty liver disease. Sometimes inflammatory changes develop in association with that fat, a condition called non-alcoholic steatohepatitis (NASH). Continued inflammation often leads to damage and death of liver cells. Attempts at healing may produce fibrotic changes, and ultimately advanced fibrotic liver disease (or cirrhosis).

Risk factors for fatty liver disease and progression of NASH include metabolic syndrome and its components, including abdominal obesity, diabetes or glucose intolerance, hypertension, and abnormal blood lipid levels. Almost everyone with morbid obesity has at least steatosis; over one-third have NASH. Over two-thirds of those with diabetes have fatty liver disease, and having diabetes increases the risk of progression of NASH. Although sedentary lifestyle and diet can influence development of fatty liver disease, there is also probably a genetic component. Less common risk factors include polycystic ovary syndrome, hypothyroidism, obstructive sleep apnea, and hypopituitarism.

Fatty liver disease is the most prevalent liver disease in the U.S. and the most common cause of abnormal liver blood tests. Fatty liver facts:

- Affects about one-third of the population and NASH probably affects about 5% of the population.¹
- Is becoming more common largely due to the increasing number of people with obesity and diabetes.²
- One or two out of every ten people with fatty liver disease will have NASH, and about one in five people with NASH may progress to cirrhosis.
- Fatty liver-associated cirrhosis is the third most common reason for liver transplantation in the U.S., and will probably be the most common within a few years.³

Symptoms, Morbidity, and Mortality

Initially, fatty liver causes no symptoms or is associated with only non-specific fatigue or mild abdominal discomfort. Because of this, fatty liver is usually diagnosed because of abnormal liver blood tests or findings on imaging studies performed for some other reason.

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Fatty liver may progress silently until the point complications from cirrhosis become obvious. Liver cancer (HCC) related to cirrhosis caused by fatty liver accounts for up to about one-third of all HCC cases. It is not known why steatosis only sometimes progresses to NASH, cirrhosis, and hepatocellular cancer. It is also not known why progression occurs gradually in some and rapidly (within 4-6 years) in others.

Overall, death in those with fatty liver disease is most closely associated with diabetes, cirrhosis, and age. Individuals with fatty liver have 9 times the rate of dying from liver disease than those without it, and the risk is especially high in those with diabetes. Although the liver-related mortality of fatty liver is largely due to cirrhosis, the overall main risk of death is from cardiovascular disease and secondly, malignancy.

The overall and cardiovascular death rate is the same for those with fatty liver with and without inflammation, even though those with NASH are much more likely to die of liver disease than those without NASH. This is thought to be due to the association of fatty liver with the metabolic syndrome and diabetes. Symptoms due to cardiovascular disease are also a major cause of the morbidity associated with fatty liver.

Diagnosis

Generally those with fatty liver, including NASH, have normal liver blood tests and abnormalities (when present) are usually mild and transient. Although disease progression can occur even with normal liver blood tests, very abnormal results increase the risk of progressive disease being present. However, the degree of abnormality does not correlate with degrees of liver inflammation or fibrosis.

Ultrasound is very good at detecting a fatty liver, but only if there is a large amount of fat present, and CT is not much better. MRI and newer imaging modalities can detect much smaller amounts of fat, and methods are being developed to distinguish the stages of fatty liver disease.

The gold standard in diagnosing and staging fatty liver disease is biopsy. If there is no inflammation on biopsy, progression to advanced liver disease is much less likely.

Treatment

Treatment of fatty liver is primarily diet and exercise. Liver biopsy findings improve with weight loss, but weight loss that is too rapid can worsen liver disease. Avoidance of alcohol is also generally suggested, but drinking coffee seems to decrease the risk of progression. Medications to control weight are sometimes administered and, if necessary, weight-reduction surgery may be performed. Medications to directly treat NASH have been used, but are not consistently beneficial and may carry significant side effects. Because cardiovascular events are the most common cause of death in those with NAFLD, control of cardiac risk factors, including with statins, is a mainstay of therapy. Periodic screening for malignancy is usually performed, including liver imaging for possible development of HCC in those with cirrhosis.

Questions to ask clients about fatty liver:

- Did you have any imaging studies of the liver? What type(s), e.g., ultrasound, CT, MRI, other? When and where was the most recent?
- Did you ever have a liver biopsy? If so, when and what were the findings?
- Did your doctor tell you what the likely cause of the fatty liver is?

The cases presented are hypothetical. Actual underwriting decisions will be based on a review of the complete medical history.

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