March 2016

Underwriting News

somewhat different

Routine medical blood testing and insurance screening commonly include tests used to measure the health of the liver called liver function tests (LFTs)

Underwriting Liver Function Tests

Hannover Re recently reviewed the mortality risk associated with an elevation of the liver function tests (LFTs). The underwriting of LFTs is somewhat unique compared with other medical impairments. For most conditions, ratings are based on a single condition i.e. a diagnosis is made and then debits are applied. In the case of the LFTs, the ratings are applied based on the test results alone, before a definitive cause is identified. In the latter case, the excess mortality is being driven by the mix of diagnoses in the group of individuals with a particular pattern of enzyme elevations. To evaluate this risk, we analyzed the mortality outcomes for the various combinations of LFT abnormalities in an insurance applicant population. This effort was supported by a review of the available medical literature.

A number of interesting observations were made in the course of this analysis regarding the mortality risk associated with LFT test results. These observations included, among others:

- Isolated alanine aminotransferase (ALT) elevations greater than twice the upper limit of normal are very unusual (only 0.041% of all individuals tested).
- Isolated ALT elevations show little to no mortality in the US population.
- Isolated aspartate aminotransferase (AST) elevations are more likely of muscle than liver origin.
- Very low normal levels of ALT and AST (< 10 U/L) are associated with an increase in mortality, likely due to reduced muscle mass.
- Isolated increases in gamma glutamyltransferase (GGT) are strongly and linearly associated with an increase in death rates.
- The increase in death rates with GGT is primarily due to cardiovascular, not liver causes.
- The order of mortality risk when two enzymes are elevated, ranked from highest to lowest, is GGT+AST, GGT+ALT and ALT+AST.
- The risk is highest when all three enzymes are above the normal range.
- A ratio of AST to ALT > 1 portends a substantial increase in risk because it is associated with increased alcohol use and/or the presence of fibrosis in the liver.
- Finding an abnormal alkaline phosphatase level in association with an elevation in one or more of the other LFTs is a marker for a significant increase in mortality risk.
- A low serum bilirubin level (< 0.2 mg/dl) is associated with increased death rates, primarily due to cardiovascular disease.
- A low serum albumin level, especially if < 3.5 mg/dl, in association with other LFT abnormalities, is predictive of a very high risk of mortality.
- Evidence of liver fibrosis on CT, MRI scan or other non-invasive tests (Fibroscan, Fibrosure) is a marker for increased risk.

hannover re®

In light of this information, extensive changes were made to the specific ratings for different enzyme combinations and degrees of elevation in the revised hr | Ascent LFT calculator. In general, there was no particular pattern to these changes (confirming the overall accuracy of the old calculator). The exceptions were that the ratings for GGT alone and GGT+ALT were generally higher and those for ALT+AST were generally lower. The actions for alkaline phosphatase and elevated bilirubin in the old calculator were confirmed and largely unchanged. Guidance was added for low serum albumin and non-invasive tests for liver fibrosis. A separate guide was created for low normal ALT and AST (<10 U/L) and bilirubin (<0.2 mg/dl), in recognition of the above noted mortality risk.

For more information contact:

Dr. Cliff Titcomb, Jr., MD
Vice President - Chief Medical Director
Hannover Life Reassurance Company of America
Tel. (720) 279-5245
cliff.titcomb@hlramerica.com