Fatty liver disease is a common cause of raised transaminase levels

when results of liver tests are out of the normal range is based mostly on observational studies of investigation of patients whose test results have been abnormal and the subsequent findings on liver biopsy. The thresholds that trigger further investigation seem to be based on logistics and availability of resources. Apart from those caused by alcohol, the great majority of transaminase abnormalities are found to be related to non-alcoholic fatty liver disease. No drug treatment for this disorder has been proved, but exercise and weight loss improve results of liver function tests. The principle of investigating these patients seems to be

How should I investigate abnormal transaminases in asymptomatic patients without risk factors for, or clinical features of, liver disease?

- If raised and $< 3 \times$ upper limit of normal—recheck in 1–3 months
- If still raised (two measurements, six months apart)—further investigation indicated as shown in other box
- If more than three times upper limit of normal (single measurement), further investigation indicated as shown in the table

How should I investigate abnormal transaminases in patients with risk factors for, or clinical features of, liver disease?

- Further investigations are advised for any enzyme rise associated with risk factors for, or clinical evidence of, liver disease except where an apparent cause is found (hypertriglyceridaemia, diabetes, alcohol, overweight), for which a six month trial of appropriate intervention is recommended

based mainly on detecting potentially treatable causes, as in case 2 above, and on the theoretical assumption that identifying non-alcoholic fatty liver disease will improve the prognosis of the patients concerned and allow treatment in the future.

The principle of interval retesting to distinguish one-off results from stable and progressive increases seems sound. There is guidance, but limited evidence, on retesting interval.⁸ In patients without symptoms, and in view of the slow time course of the potential underlying diseases, retesting with an interval of months rather than weeks seems reasonable when rises are “minor” (up to 3–5 times the upper limit of normal). What is “normal” varies by ethnic origin and age; this confusion could be solved by establishing reference ranges specific for particular groups. The term “normal range” introduces further confusion, as the values reflect a statistical range and not a definition of what is not pathological. Results outside of these ranges therefore do not necessarily indicate disease.

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The first teaching ward round: Leyden 1660

I us[ed] a method not hitherto in use . . . took them daily into the public hospital [to] see the sick to whose complaints and other notable symptoms I directed attention, asking immediately afterwards what they had observed in the disorders of the patient; their views as to the causes and proper treatment, and their reasons for the same. With me they confirmed the happy results of the treatment, . . . or assisted in the examination of the cadavers.

Franciscus Sylvius. *Epistola Apologetica* 1664. Cited by Baker F. The two Sylviuses, an historical study. *Johns Hopkins Hosp Bull* 1909;20:329–39

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