

ANOTHER POSSIBLE CAUSE OF MINIMALLY ABNORMAL LIVER

CLINICALLY
ENZYMES IN CHRONICALLY WELL INDIVIDUALS

As a result of the Federal Vinyl Standard (1910.1017) a great many working, clinically well people have been subjected to a series of blood chemistries. In one plant where only a few individuals regularly work in a Vinyl/Monomer unit, but a large number of potentially exposed individuals assigned to the Maintenance Department are tested, it is the experience that about 10%-12% of these employees have from one to three liver enzymes that are slightly elevated. The precision and accuracy of the laboratory is excellent, based on the College of American Pathologists Quality Control and National Standard Survey comparisons. A survey of pre-employment blood tests revealed a greater incidence of about 15% and contractors employees about 12%.

"Slight elevation" in this communication means up to about twice the normal value, i.e., SGOT up to 70 units, SGPT up to 80 units, and GGTP up to 130 units, where normal values are SGOT 30 units, SGPT 37 units, GGTP 65 units.

An interesting observation of these laboratory findings is that the vast majority of those who have these slight abnormalities have continued to show essentially the same abnormality over the entire number of years they have been observed.

Because the examining physician is charged under the Vinyl Standard to withdraw any employee from possible contact with Vinyl Chloride whose "health would be materially impaired by continued exposure", it was deemed desirable to attempt to identify the cause or causes of these abnormalities.

The known causes of these laboratory findings include alcohol ingestion, drug taking (especially anti-histamines, anti-hypertensives, anti-diabetics and many tranquilizers), as well as uncontrolled diabetes, viral diseases

including incipient or subsiding. Each of the employees was questioned in detail about drug taking alcohol. Very few admitted to more than occasional social drinking, and this was usually beer. An occasional employee admitted to taking an occasional anti-histamine or tranquilizer. None admitted to taking medication regularly. An attempt to evaluate the alcohol consumption of these employees was made by asking of their working associates with whom many would also socialize on occasion. Again the opinion was that very few could be blamed on alcohol consumption.

None of these individuals had any complaints thought to be of significance. None were diabetic. No abnormal hematology was found. One possible correlating factor was body weight. This was suggested by an hourly maintenance employee who was in line for promotion to be a supervisor, but as such, he would be expected to go into the Vinly area. This promotion could not be given if his laboratory tests remained abnormal. A complete workup was done including a consultation with a gastroenterologist. No satisfactory explanation was offered. Because the triglyceride level was mildly elevated (293 %), he was advised to reduce his body weight.

DATE	WEIGHT	SGOT	SGPT	GGTP
1/23/68	177	-	39u	-
7/23/72	191	-	45u	-
3/5/74	191	81u	85u	-
7/29/76	181½	67u	110u	30
10/22/76	175	16u	52u	33
9/19/77	188	50	78	31
9/13/78	198	60	106	32

The above table indicate that both the Transaminase levels are elevated except on 10/25/76 when this employee had successfully reduced his weight

attempting to get his abnormal enzymes to acceptable levels. They returned promptly to their re-weight reduction level with the regaining of his weight. This individual of 70 inches in height and a large frame should weigh 154-171 according to Metropolitan Life tables. He stated he did not feel well at this weight and allowed himself to regain to when he felt well. His enzymes again become abnormal. His occupational exposure to any liver toxin was extremely low from 1974 thru 1977 and he neither took any medications nor consumed any alcohol.

Further review of employees who had either one, two or three abnormal enzymes showed that some % were 15% or over the maximum ideal weight for their height. The most logical explanation for this is that fatty infiltration of the liver may occur in individuals who have no disease other than moderate exogenous obesity. This condition may be a form of steatosis which is a condition described in (T & S page 333) Laboratory textbooks as being caused by alcohol and having SGOT levels less than 50 u and is given a guarded prognosis. The findings here would suggest that the condition described here would not have such a prognosis and would be revisable at least in certain individuals.

Another associated finding in out of employees with abnormal liver enzymes is an elevated triglyceride level or cholesterol level, or both. Whether this lipid elevation is related to the overweight condition or is an indication that people who have elevated lipids have them because of some underlying liver pathology is not certain. Certainly cholesterol elevations in conditions manifesting cholestasis is well known. This is doubtful here. Liver biopsy would undoubtedly answer a number of these questions. This seems a somewhat extreme diagnostic test to request our employees with no complaint or other findings to under go.

A remarkable observation by Smith, a pathologist, has been that in almost every patient who has undergone intestinal by-pass surgery for marked obesity, he has found a fatty infiltration of the liver. ~~THREE~~ Unfortunately, these individuals have not had extensive liver workups preoperatively or been followed over several years with chemistries. The hepatic cell apparently can be faced with fat as a result of exogenous obesity and as a result can give abnormal serum enzyme levels (SGOT, SGPT, GGTP). Obviously this is not the case in every person with slightly elevated enzymes but may occur and should be kept in mind as a possibility when evaluating such patients.