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# SERUM LAMININ IN HEPATOSPLENIC HUMAN SCHISTOSOMIASIS

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*Serum laminin level was measured in chronic hepatic schistosomiasis. A significant increase in the mean serum laminin levels was observed in patients with hepatosplenic (HS) schistosomiasis (2,57 ± 0,83 U/ml), as compared to those in patients with the hepatointestinal (HI) form of the disease (1,38 ± 0,45-U/ml) and in the control group (1,15 ± 0,31 U/ml). In the HS patients there was a significant direct relation between serum laminin and percutaneous splenic pulp pressure (r = 0,68). These findings are compatible with an increased production of laminin in hepatosplenic schistosomiasis with may be related to the observed enlarged liver and spleen basement membranes in such disease.*

Key words: human schistosomiasis – hepatosplenic form – serum laminin

Serum determination of laminin, a major basal membrane glycoprotein, has recently been correlated with portal hypertension in fibrotic liver diseases, mainly in cirrhosis (Gressner et al., 1986; Mal et al., 1988). Such correlation might be due to the hepatic laminin turnover, reflecting sinusoidal capillarization (Gressner & Tittor, 1986).

Hepatic schistosomiasis is one of the most prevalent diseases in tropical areas. In the advanced clinical form of the disease, hepatosplenic schistosomiasis, the main feature is liver fibrosis obstructing portal branches in portal tracts and leading to presinusoidal portal hypertension (Rebouças, 1975). Although in hepatosplenic (HS) schistosomiasis the portal hypertension results mainly from the obstruction of portal branches, collagenization and capillarization of the space of Disse have already been described in electron microscopy studies from wedge liver biopsies (Canto et al., 1977; Grimaud & Borojevic, 1977). These morphological modifications could be responsible for the additional parasinusoidal block of hepatic blood flow observed in about 40% of the patients with this form of liver schistosomiasis (Coutinho, 1968; Raia et al., 1975). Such hemodynamic features are finding in those patients where lobular modifications are frequently observed (Coutinho, 1968).

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Because of that, in a former work, we have assessed serum laminin levels in hepatic schistosomiasis studying patients with the HS form of the disease (Parise & Rosa, in Press). In eleven of such patients that had already presented previous hepatic descompensation and were submitted to splenoportography as a preoperative procedure for avaliation of portal venous system permeability, a percutaneous splenic pulp pressure measurement was obtained.

Mean serum laminin concentration in HS patients (2.57 ± 0.83 U/ml; n = 14) was significantly different from the corresponding values observed for the HI group (1.38 ± 0.45 U/ml; n = 10). A positive correlation between serum laminin and splenic pulp pressure (r = 0.68) was observed. No significant correlation was found among serum laminin and other biochemical determinations such as AST, ALT, bilirrubins, albumin, globulins and prothrombin activity.

More recently, in eighteen patients with the HS form of the disease, we found that the mean laminin serum levels were significantly more elevated in patients with previous gastrointestinal bleeding (3.14 ± 1.06 U/ml, n = 10) than in those without (2.16 ± 0.38 U/ml, n = 8). Gastrointestinal bleeding leading to ischemic necrosis has been claimed as an important cause of parenchymal desorganization in HS schistosomiasis (Andrade & Ferraz, 1971).

According to Gressner et al. (1986), the serum laminin levels in liver disease would result from the increase in the hepatic turnover of this glycoprotein. During clinical and experimental development of hepatic cirrhosis, a progressive deposition of laminin and collagen is found in the space of Disse (Hahn et al., *1980;* Martinez-Hernandez, 1985). This would correspond to the collagenization and capillarization of the sinusoids described in morphological studies (Schaffner & Popper, 1963) wich have been regarded as an important site of increased intrahepatic vascular resistance in liver cirrhosis (Orrego et al., 1979).

Although collagenization and cappilarization of the Disse space would be a convincent explanation for our findings, we cannot forget that the important increase in the spleen size usually found in HS patients is followed by an enlargement in splenic basement membranes (Borojevic & Grimaud, 1980). Since no evident deposition of laminin can be detected in the granulomatous reaction around the *Schistosoma mansoni* ova in the liver (Parise et al., 1985) the laminin serum levels and their correlation with portal hypertension we have found for HS patients, are problaby related to the enlarged liver and spleen basement membranes found in such patients. The exact contribution of each one of these organs to the laminin serum levels has to be established.

## REFERENCES


ANDRADE, Z. A. & FERRAZ, G. S., 1971. Hepatopatia esquistossomótica. *Arq. Gastroenterol., 8:* 131-136.

BOROJEVIC, R. & GRIMAUD, J. A., 1980. Collagen fibers in enlarged basement membranes in human schistosomal liver and spleen. *Cell. Mol. Biol., 26:* 247-250.

CANTO, A. L.; SESSO, A. & de BRITO, T., 1977. Human chronic mansonian schistosomiasis. Cell proliferation and fibre formation in the hepatic sinusoidal wall. A morphometric, light and electron-microscopy study. *J. Pathology, 123:* 35-44.

COUTINHO, A., 1968. Hemodynamic studies of portal hypertension in schistosomiasis. *Am. J. Med., 44:* 547-556.

GRESSNER, A. M. & TITTOR, W., 1986. Serum laminin. Its concentration increases with portal hypertension in cirrhotic liver disease. *Klin. Wochenschrift, 64:* 1240-1248.

GRESSNER, A. M.; TITTOR, W. & NEGWER, A., 1986. Serum concentration of N-terminal propeptide of type III procollagen and laminin in the outflow of fibrotic livers compared with liver distal regions. *Hepato-gastroenterology, 33:* 191-195.

GRIMAUD, J. A. & BOROJEVIC, R., 1977. Chronic human Schistosomiasis mansoni: pathology of Disse space. *Lab. Invest., 36:* 268-273.

HAHN, E. G.; WICK, G.; PENCEV, D. & TIMPL, R., 1980. Distribution of basement membrane proteins in normal and fibrotic human liver. Collagen type IV, laminin and fibronectin. *Gut, 21:* 63-71.

MAL, F.; HARTMANN, D. J.; TRINCHET, J. C.; LACOMBE, F.; VILLE, G. & BEAUGRAND, M., 1988. Laminine serique et pression portale au cours de la cirrhose alcoolique. Une etude chez 39 malades. *Gastroenterol. Clin. Biol., 12:* 841-844.

MARTINEZ-HERNANDEZ, A., 1985. The hepatic extracellular matrix II. Electron immunohistochemical studies in rats with CCl4-induced cirrhosis. *Lab. Invest., 53:* 166-186.

ORREGO, H.; MEDLINE, A.; BLENDIS, L. M.; RANKIN, J. G. & KREADEN, D. A. (1979). Collagenisation of the Disse space in alcoholic liver disease. *Gut, 20:* 673-679.

PARISE, E. R. & ROSA, H. Serum laminin in hepatic schistosomiasis. Trans. R. Soc. Trop. Med. Hyg. (in Press).

PARISE, E. R. & ROSA, H. Serum laminin in hepatic schistosomiasis. *Trans. R. Soc. Trop. Med. Hyg.* (in Press).

PARISE, E. R.; SUMMERFIELD, J. A.; HAHN, E.; WIDMANN, K. N. & DOENHOFF, M. J., 1985. Basement membrane proteins and type III procollagen in murine schistosomiasis. *Trans. R. Soc. Trop. Med. Hyg., 79:* 660-663.

RAIA, S.; MIES, S. & MACEDO, A. L., 1975. Portal hypertension in schistosomiasis. *Clin. Gastroenterol., 14:* 57-82.

REBOUÇAS, G., 1975. Clinical aspects of hepatosplenic schistosomiasis: a contrast with cirrhosis. *Yale J. Biol. Med., 48:* 369-375.

SCHAFFNER, F. & POPPER, H., 1963. Cappilarization of hepatic sinusoids in man. *Gastroenterology, 44:* 239-242.