

Lymphology 29 (1996) 50-56

THORACIC DUCT FUNCTION IN FETAL, NEWBORN, AND ADULT SHEEP

S.A. Johnson, M.C. Vander Straten, J.A. Parellada, W. Schnakenberg, A.L. Gest

Department of Pediatrics, Baylor College of Medicine, Houston, Texas, USA

ABSTRACT

We measured thoracic duct lymph flow rate versus outflow pressure in 7 chronically catheterized adult sheep and in 6 newborn lambs and compared our results to data previously obtained from 10 fetal sheep. In fetal sheep the thoracic duct lymph flow rate was 34.5 ± 17.2 ml/hr or 11.7 ± 6.0 ml/kg/hr. Fetal thoracic duct lymph flow deviated from baseline between 8 and 12 torr outflow pressure and lymph stopped at 18 ± 2.5 torr. In newborn lambs the thoracic duct lymph flow rate was 49.5 ± 22.0 ml/hr or 7.4 ± 2.5 ml/kg/hr. The range of outflow pressures over which newborn lymph flow deviated from baseline was between 15 and 18 torr and lymph flow stopped at 26.2 ± 6.4 torr. Adult sheep thoracic duct lymph flow rate was 130 ± 74 ml/hr or 2.3 ± 1.3 ml/kg/hr. Adult lymph flow deviated from baseline between 25 and 35 torr and stopped at an outflow pressure of 41.7 ± 6.7 torr. The ability of the thoracic duct to return lymph against an outflow pressure improves with maturation. However, lymph flow rate corrected for body weight is greatest in immature animals. The higher corrected lymph flow rate in conjunction with the decreased ability to pump against an outflow pressure may help account for immature animals predisposition for edema.