The liver is both the principal organ for galactose disposition and also a target of galactose-induced toxicity. In a newborn, the individual's neonatal period is the most significant and hazardous. For these reasons, we have undertaken studies of galactose metabolism and its consequences in the isolated perfused liver of the weanling rat. In a closed recirculating system using the Ussing perfusion apparatus 18-21 day old rat pups were perfused with no substrate, 10 mM glucose and galactose at 2, 4, 10, and 20 mM. Glucose production peaks at 20 mM galactose. Galactose uptake is saturated by the 10 mM level of galactose. ATP decreases with circulating galactose at 4 mM. The levels of the Leloir pathway enzymes remain constant with the exception of less than 135 minutes of perfusion. UDPG/UDPGal, G-1-P/G-6-P and lactate/pyruvate ratio remain unchanged at varying levels of galactose. No galactalitol or galactonate was produced by these livers at any level of galactose. This system provides an excellent physiological model for the investigation of the regulation and control of galactose metabolism.


A 12 y.o. girl with homoygous type II hyperlipoproteinemia has had marked improvement following portacaval (PC) shunt (Lancet, ii:944, 1973). In an attempt to explain the reduction in serum cholesterol (cholesterol levels fell 30-50% postoperatively) and to determine which, if any, end-to-side PC anastomoses and 3 had sham operations. Fast presurgery mean serum cholel chol levels ± SD were 193 ± 29 mg in controls and 196 ± 14 mg in test groups. The rate of cholel synthesis in the pre-shunt dogs was significantly lower (p<0.01) 1 month following surgery (controls = 205 ± 27 mg; tests = 127 ± 21 mg) respectively. The rate of cholel synthesis from acetate-2H2 was measured in vitro in liver biopsies from the same dogs. There were no differences in the fasting rate of cholel synthesis in the pre-shunt dogs at 1 or 4 weeks after surgery. However, fed dogs at 6 weeks had a higher rate of cholel synthesis for the controls (1063 ± 235 cpm/ug chol) compared to the tests (599 ± 136 cpm/ug chol). In 7 other dogs, all blood from the portal vein was supplied to the right lobes and from the IVC to the left lobes of the liver. The right lobes had a higher rate of lipid synthesis. In 8 other dogs, the pancreatic blood was supplied to the right lobes and the intestinal blood to the left lobes. The left side now showed a higher rate of lipid synthesis. These studies indicate that, at least in the dog, fat synthesis and other factors absorbed from the intestine, more than pancreatic hormones, regulate the rate of hepatic cholel synthesis.


Over a 14 month period we examined gastric and duodenal juice and stools from 17 affected infants in the acute phase (within 3 days of onset) and convalescent phase (5 and 20 days after onset) of their illness. All were hospitalized with severe dehydration, none had bacterial pathogens cultured from stools. In the acute phase, duodenal juice contained virus particles as seen by electron microscopy in 12 of 17 cases, a specific duodenal virus (orbi) in 10, adenovirus in 2. The diarrhea was severe and persisted over 6 weeks. Virus was not seen in gastric juice. In the convalescent phase virus was not seen in duodenal juice or in stool. In acute phase duodenal fluid was alkaline and stools were normal as they were in convalescent juice, 7.4 ± 0.7. In acute phase duodenal juices, one of which contained diploid virus. Serological studies on the same juices found no cross immunity. Our findings support the view that non-bacterial acute diarrhea is often due to an enteric agent in the majority of our cases which does not produce bacterial flora or alter enterocyte IgA concentration in the upper gut.


The use of intravenous alimentation in newborn infants has increased where oral nutrition is not possible. This study reports the response of 28 newborns (gest. 28-40 wks) to a total parenteral infusion of 3.0 g L amino acid/kg/day in dextrose during the first 7 days. The infused contained n-tyrosine or c-tyrosine. If retention was not achieved goals for the first 30-35% and remained constant from 31-40 wks. N losses were as urea and not as a amino N, suggesting that even <1 wk newborns have the capacity to utilize amino acids for all tissues. Blood amino acid levels were similar on days 1 and 6. Phenylalanine and tyrosine levels rose indicating conversion at all gestational ages. Cystine levels were negligible. Methionine levels high and taurine/methionine ratio low suggesting that cystine is an essential amino acid in <31 wk infants. These findings reverse with increasing gestation. The evidence suggests that N retention is dependent upon maturation of anabolic protein enzyme systems and that the amino acid contents of available infusates need to be varied according to gestational age.


A 12 y.o. girl with homoygous type II hyperlipoproteinemia has had marked improvement following portacaval (PC) shunt (Lancet, ii:944, 1973). In an attempt to explain the reduction in serum cholesterol (cholesterol levels fell 30-50% postoperatively) and to determine which, if any, end-to-side PC anastomoses and 3 had sham operations. Fast presurgery mean serum cholel chol levels ± SD were 193 ± 29 mg in controls and 196 ± 14 mg in test groups. The rate of cholel synthesis in the pre-shunt dogs was significantly lower (p<0.01) 1 month following surgery (controls = 205 ± 27 mg; tests = 127 ± 21 mg) respectively. The rate of cholel synthesis from acetate-2H2 was measured in vitro in liver biopsies from the same dogs. There were no differences in the fasting rate of cholel synthesis in the pre-shunt dogs at 1 or 4 weeks after surgery. However, fed dogs at 6 weeks had a higher rate of cholel synthesis for the controls (1063 ± 235 cpm/ug chol) compared to the tests (599 ± 136 cpm/ug chol). In 7 other dogs, all blood from the portal vein was supplied to the right lobes and from the IVC to the left lobes of the liver. The right lobes had a higher rate of lipid synthesis. In 8 other dogs, the pancreatic blood was supplied to the right lobes and the intestinal blood to the left lobes. The left side now showed a higher rate of lipid synthesis. These studies indicate that, at least in the dog, fat synthesis and other factors absorbed from the intestine, more than pancreatic hormones, regulate the rate of hepatic cholel synthesis.