

C6: SYNTHESIS BY THE LIVER IN VIVO

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C6 shows a common genetic polymorphism in humans (Hobart et al. 1). There are three common phenotypes: C6A with a frequency of about 37%, C6B: 14%, and C6AB: 45%. Where the phenotype of the donor of an organ transplant differs from that of the recipient it is possible to investigate whether the transplanted organ is the site of synthesis of C6. This approach has previously been applied to C3 by Alper et al. (2), who were able to show that the liver is the principal site of C3 synthesis in man.

Methods, Materials, and Results

C6 allotyping was carried out by the method of Hobart et al. (1), by using a thin slab polyacrylamide gel electrofocusing, followed by a functional overlay technique.

The patient reported here was a 51-yr-old male with biliary cirrhosis. The liver donor was a 52-yr-old male who died after a subarachnoid hemorrhage. Serum samples were obtained from the donor; and before, 10 days after, and 17 wk after operation from the recipient. 10 pints of blood were given to the recipient at the time of operation and 2 further pints during the subsequent 24 h. The postoperative course was uneventful and the patient was in good health 17 wk after the operation.

The phenotypes of the patient and donor are shown in Table I.

Discussion

The results show an unequivocal and total conversion of the recipient's phenotype to that of the liver donor at 10 days and at 17 wk after transplantation. Since the type of donor was B, the least common of the three common C6 phenotypes the result is especially clear. Were there any residual C6 from blood transfusion or from the patient's own synthesis before transplantation, it would be expected to contain a significant level of A phenotype since this was the type of the recipient and is present in 83% of the normal population either as homozygous or heterozygous phenotype.

The finding that the liver is the principal site of C6 synthesis in vivo accords well with the report that rabbit liver slices synthesizes C6 in vitro (Rother et al. 3).

The result reported here provides information on the organ rather than the cell type involved in C6 synthesis. The total nature of the conversion would however, be easier to understand if it were the hepatocytes which make C6.

In the case of C3 where total conversion of phenotype was also found (Alper et

TABLE I
C6 Phenotypes

Donor	Recipient		
	Before operation	10 days postoperatively	17 wk postoperatively
B	A	B (No C6 of A pattern visible)	B (No C6 of A pattern visible)

al., 2), it is nevertheless known that C3 can be made by monocytoïd cell lines in vitro (Einstein et al. [4]) and by the rheumatoid synovium (Ruddy and Colten 5). It therefore seems inescapable that C3 can be made by cells other than hepatocytes and a similar result cannot be excluded for C6.

Summary

The allotype of the sixth component of complement was determined in a patient before and after liver transplantation. The C6 phenotype changed from A before transplantation to B (the donor phenotype) within 10 days of the transplant and remained wholly of the donor phenotype at 17 wk. This demonstrates that the liver is the exclusive or predominant site of C6 synthesis in vivo in man.

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