RESULT

Following successful pancreatic transplantation, the fasting blood glucose and the post-prandial blood glucose levels usually reache a normal or nearly normal values.*(Lillehei et al.,1970; Groth et al.,1976)*. In some instances such an immediate normalization may, however, not occur, because of initial poor function of the graft. This might be due to β cells damage secondary to an ischaemic injury to the graft or due to some special post operative treatment protocol, such as the continuous infusion of somatostation. Also the intravenous infusion of glucose solution in the early post-operative phase will promote hyperglycaemia. When hyperglycaemia occurs insulin should be given and some groups use small dose of insulin routinely during the first days or weeks. An interesting question is whether hypoglycaemia occurs after a pancreatic transplantation. It has been reported that low blood glucose levels may occur immediately after revascularization of the graft but this has not been observed by others. This hypoglycaemia is due to the wash out of insulin from the graft. Therefore during this surgical period blood glucose has to be measured very frequently.*(Landgraf et al.,1986)*

During the long term follow up after pancreatic transplantation, blood glucose is found to be normal in the majority of the patient and the investigations show normal values as the HbAI, fasting and post prandial blood glucose, C-peptide and other investigation. The 24 hour metabolic profile has been carefully studied by some

investigators. Thus ***Pozza et al.,(1985)*** found that compared with normal subjects the pancreatic transplant patients has had mildly raised blood glucose levels, hyperinsulinaemia and delayed post-prandial insulin peaks. Also there is significant elevation in the C-peptide levels. An important cause for this lies in the fact that insulin delivery is to the systemic circulation and not to the portal vein and thus the normally occurring removal of approximately half of the insulin during its first passage through the liver is avoided. Another possible explanation might be an increased insulin production secondary to reduced insulin sensitivity due to corticosteroid medication (increased insulin secretion is observed in healthy subjects after only 40 mg of prednisolone).***(Hoogwerf and Goetz, 1983)*** but it was found that, inspite of systemic insulin delivery, normal glucose regulation is obtained after pancreatic transplantation.

Studies of oral glucose tolerance test and intravenous glucose tolerance test in pancreatic graft recipients have provided somewhat disparate results. Already in some early studies it was observed that, while some patients had a normal response to the oral glucose tolerance test, some had impaired glucose tolerance and some had a diabetic response.***(Traeger et al.,1983)*** The possible reason for this may be attributed to corticosteroid or immunosuppressive medication and only in some patients who were given immunosuppression without corticosteroid was intravenous glucose tolerance test normal.***(Landgraf et al.,1986)***

Another possible explanation to an impaired glucose tolerance could be that an insufficient β cell mass has been transplanted specially when a segmental pancreatic graft is used. Support for this assumption has been obtained by the recent observations that a similar glucose control existed in recipients of segmental graft as in non diabetic patients who had undergone partial pancreatectomy for carcinoma.*(Brons et al.,1987)*

In conclusions, after successful pancreatic transplantation, the patient's blood glucose levels usually normalized within hours or days and exogenous insulin treatment can be discontinued. As a rule, the patients then maintain normal or near normal levels of fasting blood glucose. Most of the patients have normal oral and intravenous glucose tolerance tests while in some impaired. The main reason for abnormal glucose tolerance test is probably the diabetogenic effects of cyclosparine and prednisolone (immunosuppressive therapy). The levels of serum insulin are usually elevated, partly because of systemic insulin delivery from the graft and partly because of decreased insulin sensitivity secondary to glucocorticoid treatment. Anyhow, the hepatic glucose handling is normal.

The blood glucose control remains unchanged with time in most patients. Clearly, the long-term metabolic control that is obtained after pancreatic transplantation is superior to what can be achieved with any other method in patients with IDDM.

SUMMARY

SUMMARY

Inspite of the advances in the medical technology of treatment of diabetes the patients still ran the risk of intermittent hypo-or hyperglycaemia. The goal is to achieve normoglycaemia in diabetic patients and to halt or reverse diabetic complications. It was found that the only way to solve this problem is to transplant the endocrine tissue which secrets insulin according to the need of the body which is the whole or part of the pancreas.

From December 1986 to July 1992 4000 clinical pancreatic transplantation had been performed. Usually cadaver organs are used and most recipients have diabetic end-stage renal disease; both kidney and pancreas are transplanted in a single operation. Increasingly however, as success grows, pancreatic transplantation is being carried out in patients before advanced renal disease occurs. In fact, one fourth of all pancreatic transplantation performed between 1986 and 1990 did not receive a simultaneous kidney.

Successful whole-organ or segmental pancreatic transplants produce circulating insulin and normal plasma glucose levels. When the venous drainage of the pancreatic graft is hooked up to the systemic circulation, the circulating insulin levels are higher than when the venous anastomosis is made to the portal system, although the plasma glucose levels are similar. Rejection episodes are as difficult to reverse as they are to detect. Also rejection is difficult to be detected by means of the change in the blood

glucose levels, because when blood glucose becomes abnormal, rejection is usually too far advanced to be reversed. Serum amylase do not become elevated when rejection episodes occur, so it can't be taken as marker for rejection. When pancreatic duct is anastomosed to the bladder, however the urine amylase level can be monitored because it falls early in the rejection response. Thus drainage of the exocrine secretion to the urinary bladder is the most successful technical solution and also permits better immunologic monitoring of the rejection response. The exocrine secretion could be also drained to the gut or prevented by ligation or injection of the pancreatic duct by synthetic rubber material.

Experience in human beings, has shown that functioning vascularized pancreatic allograft will correct the metabolic deficiency in diabetes and it also prevent further progress in the secondary complication of diabetes, furthermore the renal complication may be reversed. The techniques are now more safer and more successful. Graft survival has been steadily improving; for patient who received grafts between 1988 and 1990, slightly greater than 60% of grafts were functional at 36 months in contrast with only 18% in 1978-1982. Most current clinical research continues to focus on methods of pancreatic exocrine secretion without inducing pancreatitis. Rejection thrombosis, and fibrosis still remain problems to widespread clinical application in the early stage of diabetes. Following successful pancreatic transplantation, the patient becomes insulin independent, and can also abandon all dietary restrictions. To many patients the freedom

to eat whenever and whatever they wish has great social implications. Also in psychological sense the quality of life is much enhanced after successful pancreatic transplantation. Many patients express a sense of great relief and freedom; a long-lasting disease has come to an end. Also it is by now clear that the metabolic control is superior to what can be achieved with any other form of treatment available today. These impressive advantages have to be weighed, however against the risk of the surgical procedure and by the immunosuppressive treatment required after transplantation. When pancreatic transplantation is carried out in conjunction with renal transplantation, these problems are largely circumvented. However, when single pancreatic transplantation is to be carried out, it must be performed only when the risks of surgery and immunosuppression are similar or smaller than the risks incurred by the patient's disease.

In practice, however this is not an easy judgement. It is, however, important to consider not only the life span but also the life quality of the patient. What if the remaining life will entail uraemia, blindness and amputations. So with better selection of the patients, better techniques and less surgical complications, pancreatic transplantation will be the best treatment for type I and occasional patients of type II D.M.