NOTES FOR MEDICAL SHO/SpR

MANAGEMENT OF PATIENTS WITH DIABETES DURING SURGERY

AIMS

To ensure that hospital admission is not prolonged and complications do not occur specifically because of diabetes by:

1 Avoiding hypoglycaemia, particularly at the time of induction of anaesthesia (potentially fatal).

2 Avoiding excess hyperglycaemia (greater than 11 mmol/l), as this impairs phagocyte function, delays wound healing and increases thromboembolic risks.

THE SYSTEM

The person on call for surgical diabetes should be informed by the Surgical House Officer as soon as a diabetic patient is admitted. Such patients must be seen on the day of admission and assessed. Capillary blood glucose monitoring (qid) must be started on admission.

INSULIN TREATED PATIENTS

Pre-operative

1 Optimise blood glucose control if time permits, aiming for fasting blood glucose concentrations between 4 and 7 mmol/l. If blood glucose control is exceptionally poor (fasting blood glucose over 11 mmol/l or others over 13 mmol/l) surgery may (rarely) be postponed. Discuss with SpR or Consultant if delay seems advisable.

2 Check for complications of diabetes which may complicate management (cardiac, renal, peripheral neuropathy, proliferative retinopathy).

3 Complete the appropriate green surgery management form and make a brief entry in the patients notes.

4 Patients on Glargine insulin should continue this, and the dose of Actrapid added to the GIK should be decreased by 50%.

Peri-operative

1 All patients should be managed by use of combined glucose/insulin/potassium intravenous infusion (GIK regime). The usual regime consists of 10% dextrose with 0.15% KCL and 16 units of Actrapid insulin added to a 500 ml bag. It is essential that a 1 ml insulin syringe with detachable needle is used to add the insulin to the bag, as the 0.5ml syringe with integral needle tends to leave the insulin locked in the injection port. The bag must be well mixed and infused at 80 ml/h using a IMED pump.
Thin well-controlled, insulin sensitive patients may have reduced insulin requirements. This is especially so in pancreatic diabetes (post-pancreatectomy or chronic pancreatitis) when only 8 units per bag should be the starting dose. Patients with insulin resistant states (severe infection, gross obesity, steroid therapy) are likely to need increased insulin dosage.

2 If initial blood glucose is outside the range of 6 to 11 mmol/l an appropriate adjustment to starting insulin concentration should be advised. (See below).

3 The blood glucose is monitored hourly using the Companion 2 meter. Change in concentration of insulin in the GIK is required in only a proportion of cases. If blood glucose rises above 11 mmol/l, and is confirmed so to do by repeat BG measurement, then increase the insulin in the bag by 25 to 50%, depending on rate of rise. Further changes may be required. Similarly if blood glucose falls below 6 mmol/l decrease the insulin concentration in the bag by 25% unless the rate of all appears to be greater than 3 mmol/l per hour, when the insulin should be decreased by 50%.

4 Post-operatively if the blood glucose is stable it may be checked two hourly. Continue the GIK infusion until the patient is able to eat a full meal. Oral fluids and light diet can be given with the GIK running.

5 When converting to subcutaneous insulin, continue the GIK infusion for 30 to 60 minutes after giving the first dose of subcutaneous insulin to allow time for subcutaneous absorption to get under way.

6 Ensure urea and electrolytes are checked daily, hyponatraemia may develop with prolonged use of GIK especially in the presence of renal failure. If serum sodium falls below 130 mmol/l, change infusion regime to 20% dextrose with double the concentration of Actrapid and KCL. This regime should also be used if fluid overload is a problem. It can be administered into a peripheral vein.

Post-operative

In writing up regular subcutaneous insulin it must be realised that change in insulin dosage should be exceptional. The dose to be given should be the same as that at the same time in the last 24 hours unless there are particular changing circumstances (especially infection). One-off very high or very low BG readings should always be ignored. If a BG result is much higher or much lower than anticipated, then suspect a transient problem, perhaps dietary. Look for other reasons for change in glycaemic control (the patient is usually well aware of potential reasons).

NON INSULIN TREATED PATIENTS

Pre-operative

1 Optimise control as times permits, aiming for fasting blood glucose concentration of 4 to 9 mmol/l. If control is very poor, with fasting blood glucose values over 11 mmol/l temporary insulin therapy should be commenced using pre-prandial Actrapid with intermediate acting insulin (eg Protaphane) at bedtime.

2 Long acting sulphonylureas such as Chlorpropamide and Glibenclamide may cause hypoglycaemia especially in the elderly and should be substituted 2 to 3 days pre-operatively by Tolbutamide or Gliclazide.

3 Metformin should be stopped for 24 hours post-operatively.

4 Note the presence of concomitant disease, particularly cardiovascular problems.

Peri-operative

1 If diabetic control is acceptable (blood glucose all under 11 mmol/l. Simply arrange for the oral hypoglycaemic agent to be omitted on the day of surgery. Monitor blood glucose concentrations 2 hourly and avoid infusion of glucose and lactate containing fluids. (Hartmann's, dextrose saline, dextrose). When the patient is able to eat, the oral agent should be resumed.

2 If the blood glucose control is poor (fasting over 11 mmol/l). Manage as for insulin treated patients. For these individuals, it is often necessary to use subcutaneous insulin temporarily once they are able to eat.

Patients with Renal Failure - creat above 150 umol/l)

If control with insulin is indicated:

1 Use 10% Dextrose + 12 units of insulin WITH NO POTASSIUM as starting regimen.
2 Infuse 500 ml over 12 hours.
3 Monitor Na+ and K+ at least daily and at least twice in the first 12 hours of infusion.
4 Liaise closely with the renal team.

NB For management of diabetes on CCU see guidelines at nurses station ***RT 15/09/04***