

Background

Diabetes is a serious long term complication affecting post-transplant patients. The estimated incidence of new-onset diabetes (NODAT) post-transplant ranges from 2-53% depending on the definition used, type of immunosuppressive therapy, age, race and other factors.

Patients with NODAT are at risk of micro and macrovascular complications, increased risk of infection and graft complications. A patient with NODAT is at 22% increased risk of death compared to transplant patients without diabetes.

A number of factors predispose to NODAT

1. Age > 40 years
2. Black or Hispanic ethnicity
3. Family history of diabetes
4. Impaired glucose tolerance
5. Obesity
6. Immunosuppressive therapy especially tacrolimus and steroids
7. Hepatitis C infection

Immunosuppressive therapy

13.4% patients develop NODAT on a calcineurin inhibitor. The effect is more marked with tacrolimus (RR 1.53) but comparable to ciclosporin if tacrolimus levels are maintained at 5-12 ng/l.

The use of azathioprine, mycophenolate or sirolimus is not associated with NODAT.

In patients at high risk of NODAT

Consider early withdrawal of steroids from immunosuppressive regimen

Consider conversion from tacrolimus to another agent

However, it is important to carefully review the benefit gained in terms of risk reduction for NODAT whilst not exposing a patient to increased risk of rejection.

Monitoring

1 Fasting blood glucose

- **Weekly for first 4 weeks after transplant**

- Then 3m, 6m and annually thereafter

1.1.1 Diagnosis of diabetes

1. Diabetes symptoms (ie polyuria, polydipsia and unexplained weight loss) plus

- a random venous plasma glucose concentration ≥ 11.1 mmol/l
- **or**
- or a fasting plasma glucose concentration ≥ 7.0 mmol/l (whole blood ≥ 6.1 mmol/l)
- **or**
- plasma glucose concentration ≥ 11.1 mmol/l two hours after an oral glucose tolerance test (OGTT).

2. With no symptoms diagnosis should not be based on a single glucose determination but requires confirmatory test. At least one additional glucose test result on another day with a value in the diabetic range is essential, either fasting, from a random sample or from the two hour post glucose load. If the fasting or random values are not diagnostic the two hour value should be used

Values for diagnosis of diabetes mellitus and other categories of hyperglycaemia

Plasma (venous) glucose concentration, mmol/l

Diabetes Mellitus:

Fasting	> 7.0
or	
2-h post glucose load	> 11.1

Impaired Glucose Tolerance (IGT):

Fasting (if measured) and	< 7.0
2-h post glucose load	< 7.8

Management

Lifestyle measures, Weight control, refer dietician for dietary advice

Check HbA1C

Review immunosuppression (consider reduction in steroids/other modifications after discussion with Consultant)

Patients who are symptomatic and ketonuric require insulin therapy and referral to the Diabetes team

In patients uncontrolled on diet alone a sulphonylurea should be started and dose titrated incrementally to control blood glucose

Metformin can be used provided the eGFR is >45ml/min and should be discontinued if GFR falls below this level

Glitazones can be used but fluid retention may be a problem.

Referral to the Diabetes service can be made by Fax: 01162733067

References

Davidson J, Wilkinson A. New onset diabetes post-transplant. 2003 International Consensus guidelines. Transplantation. 2003; 75: S23-24.

European Best Practice Guidelines for renal transplantation. (Part 2). Nephrology, Dialysis and Transplant 2000; 17(Suppl 4): 1-67.

<http://www.diabetes.org.uk/infocentre/carerec/newdiagnostic.htm>

Definition, Diagnosis and Classification of Diabetes Mellitus and its Complications. Report of a WHO Consultation. Part 1: Diagnosis and Classification of Diabetes Mellitus. World Health Organization 1999

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REVIEW RECORD

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1.4.09		J Feehally	Minor wording

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