# New Onset Diabetes Mellitus Post Renal Transplant In South West Wales

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## Background

New-onset diabetes after transplantation (NODAT) is a multifactorial metabolic disorder associated with impaired long-term graft function reduced recipient survival and increased risks of cardiovascular disease.

The incidence and impact of NODAT is generally underestimated due to inconsistent criteria used for its diagnosis in the past and to the generally short observation periods in previous trials. NODAT is currently defined as Diabetes developing in any patient without history of diabetes before Tx and sustained hyperglycemia that meets the current diagnostic criteria by ADA or WHO. The incidence quoted in literature is variable ranging from 2-50%. There are no national guidelines specific for NODAT at present.

## Objectives

- Look at the prevalence of NODAT in South West Wales
- Assess the factors causing NODAT in our population
- Audit the management of diabetes and the associated risk factors

## Methods

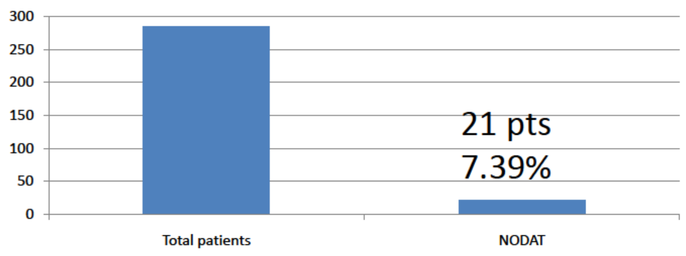
Data from 284 renal transplant patients was collected from Vitaldata and clinic letters.

NODAT was defined using ADA criteria:
- Hemoglobin A1c ≥ 6.5% (48 mmol/mol)
- Fasting blood glucose ≥ 7.1 mmol/L on 2 consecutive occasions,
- Random blood glucose ≥ 11.1 mmol/L
- Blood glucose ≥ 200 mg/dl (11.1 mmol/L), 2 hours after 75 grams of glucose after an overnight fast

Criteria of control was assessed using **NICE updated guidance** for the management of type 2 diabetes mellitus.

## Results

**Percentage of patients with NODAT**




**Onset of DM post Tx in Months:**
Mean 71.7 months
Median 48 months
( 9 - 311 months)

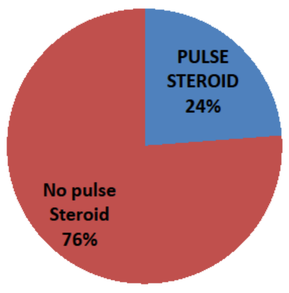
**Weight Gain post Tx to onset of NODAT:**
- Patients with no weight gain: 5
- Patients with less than 1 Kg weight gain: 3
- Patients with 1 – 5 Kg weight gain: 2
- Patients with 5 – 10 Kg weight gain : 4
- Patients with more than 10 Kg weight gain: 7

**Immunosuppressive Regimen**

| Immunosuppressive Drug | % OF Cases using it |
|---|---|
| Tacrolimus | (14 cases) 66.6 % |
| MMF | (9 cases) 42.9 % |
| Cyclosporin A | (4 cases) 19.04% |
| Azathioprine | (3 cases) 14.3% |
| Sirolimus | (3 cases) 14.3 % |
| Myfortic | (1 case ) 4.8 % |
| Prednisolone | (20 cases ) 95.2% |

6 of the 20 pts not on tacrolimus were on steroids

**Episodes of rejection treated with pulse steroids**




**Blood Pressure control**

| | |
|---|---|
| <130/80 | 11 cases (52.4%) |
| >130/80 | 10 cases (47.6%) |

**Aetilogy of ESRD in our patients**

| Primary Diagnosis | % |
|---|---|
| Pyelonephritis and interstitial nephritis with or without Reflux nephropathy | 33.3 % ( 7 cases) |
| Glomerulonephritis | 33.3 % ( 7 cases) |
| Polycystic Kidney Disease adult type (Dominant) | 23.8 % ( 5 cases) |
| Goodpasture`s Syndrome | 4.8 % (1 case) |
| Chronic Renal Failure of uncertain aeitiology | 4.8 % (1 case) |

**Treatment of NODAT in our patients**

| Oral | 42.9 % ( 9 Cases) |
|---|---|
| Insulin | 28.6 % (6 Cases) |
| Diet Control alone | 23.8 % ( 5 Cases) |
| Insulin + Oral | 4.8 % ( 1 case) |

**HbA1c in our NODAT patients (NICE recommends <48mmol/mol/6.5%)**

Range : 40 – 116 mmol/mol
Mean ± SD : 61.8 ± 21 mmol/mol
Median : 54 mmol/mol

**Lipid control**

| | |
|---|---|
| Well controlled (Cholesterol <4,LDL<2) | 12 cases (57.1%) |
| Not well controlled | 9 cases (42.8%) |
| On statins | 13 cases(61.9%) |

**Graft function in our NODAT pts**

| eGFR ( ml/min) | % of patients |
|---|---|
| 60-90 | 42.9 % (9 Cases) |
| 45-60 | 33.3 %( 7Cases) |
| 30-45 | 9.5 % (2 Case ) |
| 15-30 | 14.3 % (3 Cases) |
| 0-15 | 0% |

## Conclusion

The prevalence of NODAT in our unit is comparable with data from other units. 33% had a weight gain >10kgs prior to the diagnosis of NODAT. All except one patient was on steroids and 66.6% were on Tacrolimus. Glycaemic control was satisfactory in our patients.

Blood pressure and Lipid management did not meet the NICE guidance and will need closer attention. Patients at risk of NODAT would benefit from strategies including exercise programme pre and post transplantation, tailoring immunosuppressive therapy (early steroid withdrawal and rationalized Tacrolimus usage) and a multidisciplinary approach with close liaison with the diabetic team. National guidelines specific for NODAT may be helpful.

## References

**New-onset diabetes after renal transplantation: diagnosis, incidence, risk factors, impact on outcomes, and novel implications.**Kaposztas Z, Gyurus E, Kahan BD.Transplant Proc. 2011 Jun;43(5):1375-94.

**Standards of Diabetic care 2010.** *Diabetes Care January 2010 vol. 33 no. Supplement 1 S11-S61*

**Updated Nice guidelines for type II DM 2009.**
http://guidance.nice.org.uk/CG87/NICEGuidance/pdf/English

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