



Prevalence of biochemical hypoglycaemia in everyday practice

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INTRODUCTION

Oral glucose tolerance test (OGTT) is the main tool in population based screening for type 2 diabetes mellitus. Sometimes OGTT results show asymptomatic lowering of post-load blood glucose. Post-load plasma glucose (2hPG) level ≤ 3.9 mmol/l (70 mg/dl) shows biochemical hypoglycaemia. Biochemical hypoglycaemia might be observed among individuals with abnormal glucose tolerance and in a healthy population. Recent studies have reported different prevalence of biochemical hypoglycaemia: idiopathic reactive hypoglycaemia was found in 12.4% of elderly people [1], in 23% of healthy Asian Indians [2], in 50% of lean young women with polycystic ovary syndrome [3] and in 5.5% of UK multi-ethnic population [4]. Wide variety in the rate of biochemical hypoglycaemia can be explained by different

post-load plasma glucose levels selected to define biochemical hypoglycaemia and different populations studied. Biochemical hypoglycaemia is associated with younger age, white European ethnicity. Recent studies have showed that biochemical hypoglycaemia during an OGTT in the absence of diabetes or impaired glucose regulation is not associated with insulin resistance, but instead appeared to be associated with more favourable glycaemic and metabolic risk profiles namely lower body mass index, lower body fat percentage, higher HDL cholesterol, lower triglycerides, higher insulin sensitivity, lower fasting glucose and HbA1C than normal glucose tolerance and impaired glucose regulation [2, 4]. According to data, clinicians may not need to intervene due to biochemical hypoglycaemia on a 2-h OGTT [4].

OBJECTIVE

The objective of the investigation was to assess a prevalence of biochemical hypoglycaemia during OGTT in routine outpatient practice.

MATERIAL AND METHODS

We conducted an audit of 75 g standardized OGTT performed at Vilnius Antakalnio outpatient clinic from 03Jan2011 to 15Dec2014 and analysed data of 5575 adult patients. We applied 2006 WHO criteria for impaired fasting glucose (IFG), impaired glucose tolerance (IGT) and diabetes. Patients with biochemical hypoglycaemia during OGTT, and with normal glucose tolerance (NGT) or IFG were compared using Student t-test. The significance level chosen to test statistical hypotheses was 0.05.

RESULTS

Mean patients' age was 53.64 ± 15.59 years (36.4% male and 63.6% female). Mean FPG was 5.87 ± 0.65 mmol/l, mean 2hPG was 6.20 ± 2.25 mmol/l. OGTT detected IFG in 1518 (27.2%), IGT in 778 (14.0%), diabetes in 286 (5.1%) patients. NGT was found in 2993 patients.

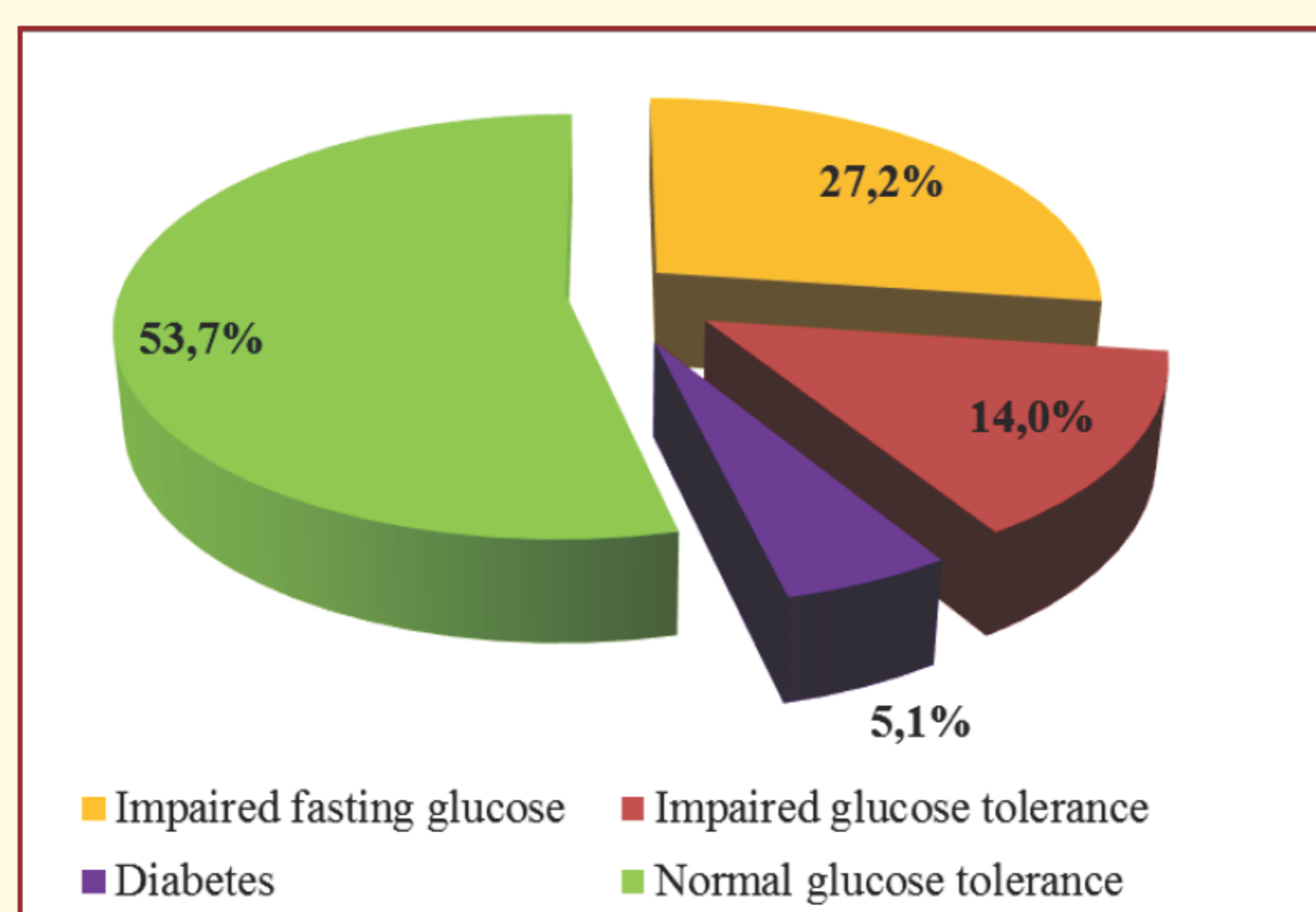


Figure 1. Distribution of patients by OGTT results

Total 760 patients (13.6%) have had biochemical hypoglycaemia: 547 (18.3%) patients with NGT and 213 (14.0%) patients with IFG.

CONCLUSION

Prevalence of biochemical hypoglycaemia is about 14% in routine outpatient practice. Biochemical hypoglycaemia is associated with younger age, male gender and lower fasting plasma glucose level.

Table 1. Comparison of NGT patients' with and without biochemical hypoglycaemia

Variable	Biochemical hypoglycaemia, N=547	Without biochemical hypoglycaemia, N=2446	p
Age, years	45.70 ± 14.32	50.72 ± 16.12	<0.0001
FPG, mmol/l	5.38 ± 0.45	5.45 ± 0.42	0.001
2hPG, mmol/l	3.40 ± 0.47	5.64 ± 0.98	<0.0001
Male/female, %	24.4 / 15.5	75.6 / 84.5	<0.0001

Within NGT group patients having biochemical hypoglycaemia were younger by 5.02 years ($p < 0.0001$) and had lower level of FPG by 0.07 mmol/l ($p = 0.001$) than those who didn't present biochemical hypoglycaemia. Males experienced biochemical hypoglycaemia more frequently than women (24.4% vs 15.5%, $p < 0.0001$).

Table 1. Comparison of IFG patients' with and without biochemical hypoglycaemia

Variable	Biochemical hypoglycaemia, N=213	Without biochemical hypoglycaemia, N=1305	p
Age, years	52.83 ± 12.01	56.44 ± 13.42	<0.0001
FPG, mmol/l	6.41 ± 0.24	6.50 ± 0.31	<0.0001
2hPG, mmol/l	3.46 ± 0.38	5.88 ± 1.05	<0.0001
Male/female, %	20.0 / 9.0	80.0 / 91.0	<0.0001

Within IFG group patients with biochemical hypoglycaemia were younger by 3.61 years ($p < 0.0001$) and had lower level of FPG by 0.09 mmol/l ($p < 0.0001$) than those who didn't present biochemical hypoglycaemia. Males experienced biochemical hypoglycaemia more frequently than women (20.0% vs 9.0%, $p < 0.0001$).

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