

A large series of insulinomas: general characteristics and evaluation of beta-cell function and insulin sensitivity

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Background

Patients with an insulinoma are at variable risk of severe hypoglycemia due to the wide ranges of tumoral insulin secretion and peripheral tissue sensitivity to chronic hyperinsulinaemia.

Objectives

In this study we investigated the clinical, biological and tumoral characteristics of a large series of patients with insulinoma and we evaluated the sensitivity of peripheral tissues to insulin before and after surgery.

Methods

This was a retrospective analysis of 40 patients followed between 1982 and 2012 in our institution and in whom insulin sensitivity and beta-cell function were evaluated by HOMA test without concomitant hypoglycaemia.

Results

Table 1 . Patient characteristics

	N	mean ± SD or median (P5-P95)*	P value
Age of onset of symptoms (y)	40	48,8 20,1	
Men	15	46,1 21,8	p=0,598
Women	25	50,4 19,4	
Age at diagnosis (y)	40	50,7 19,9	
Men	15	48,5 21,7	p=0,519
Women	25	52,0 19,1	
BMI (kg/m ²)	38	26,1 5,4	
Men	13	25,3 3,8	p=0,507
Women	24	26,6 6,1	
Maximum tumor diameter (pathology report) (mm)	31	14,0 (8,0–60,5)*	
Maximum tumor diameter (imaging report) (mm)	35	15,0 (8,0–49,6)*	
Overall survival (months)	38	256 (189–323)*	
Survival without recurrence (months)	35	183 (178–188)*	

Figure 1. Distribution of the symptoms

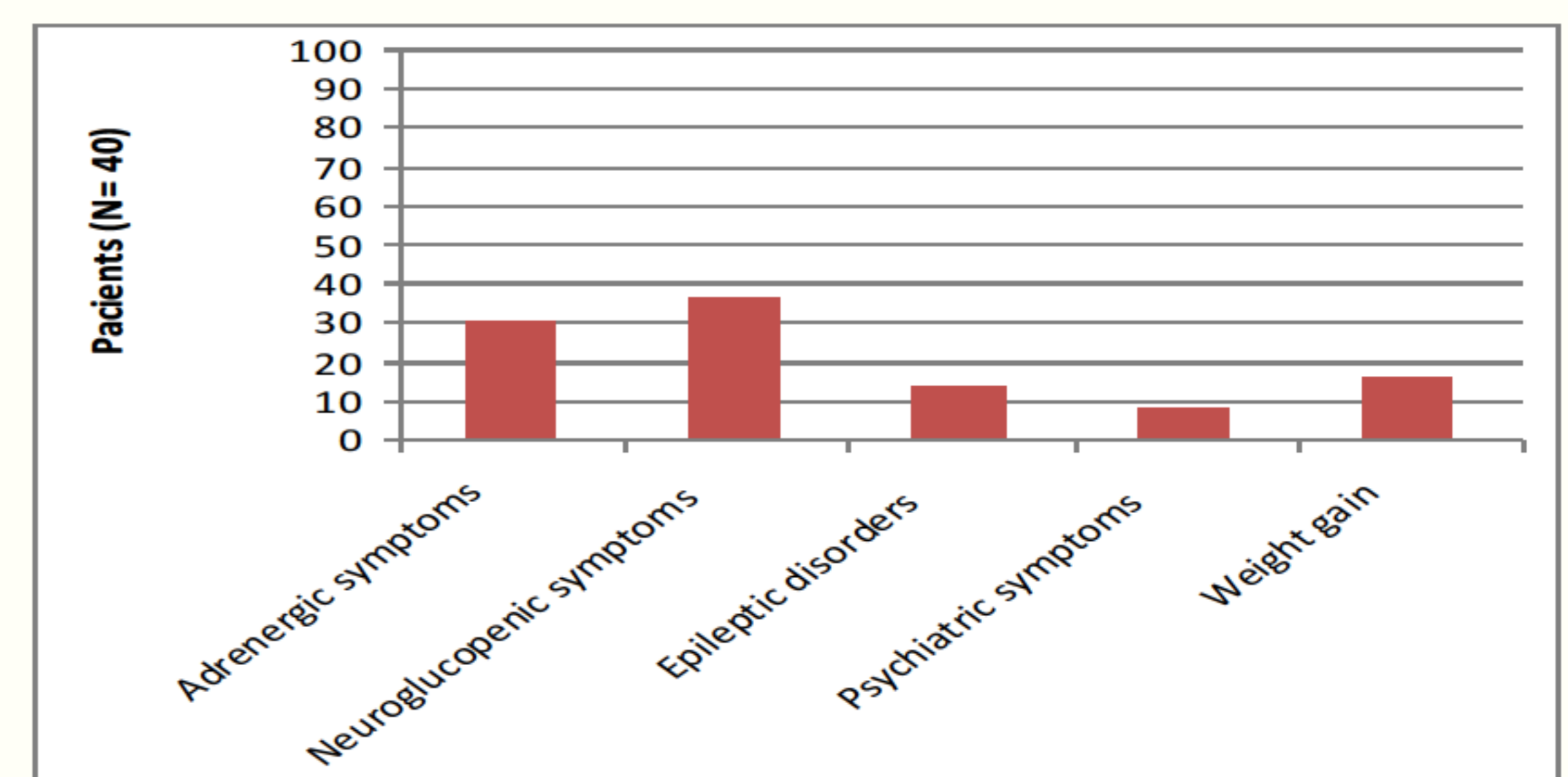


Figure 2 . Sensitivity of the localization techniques

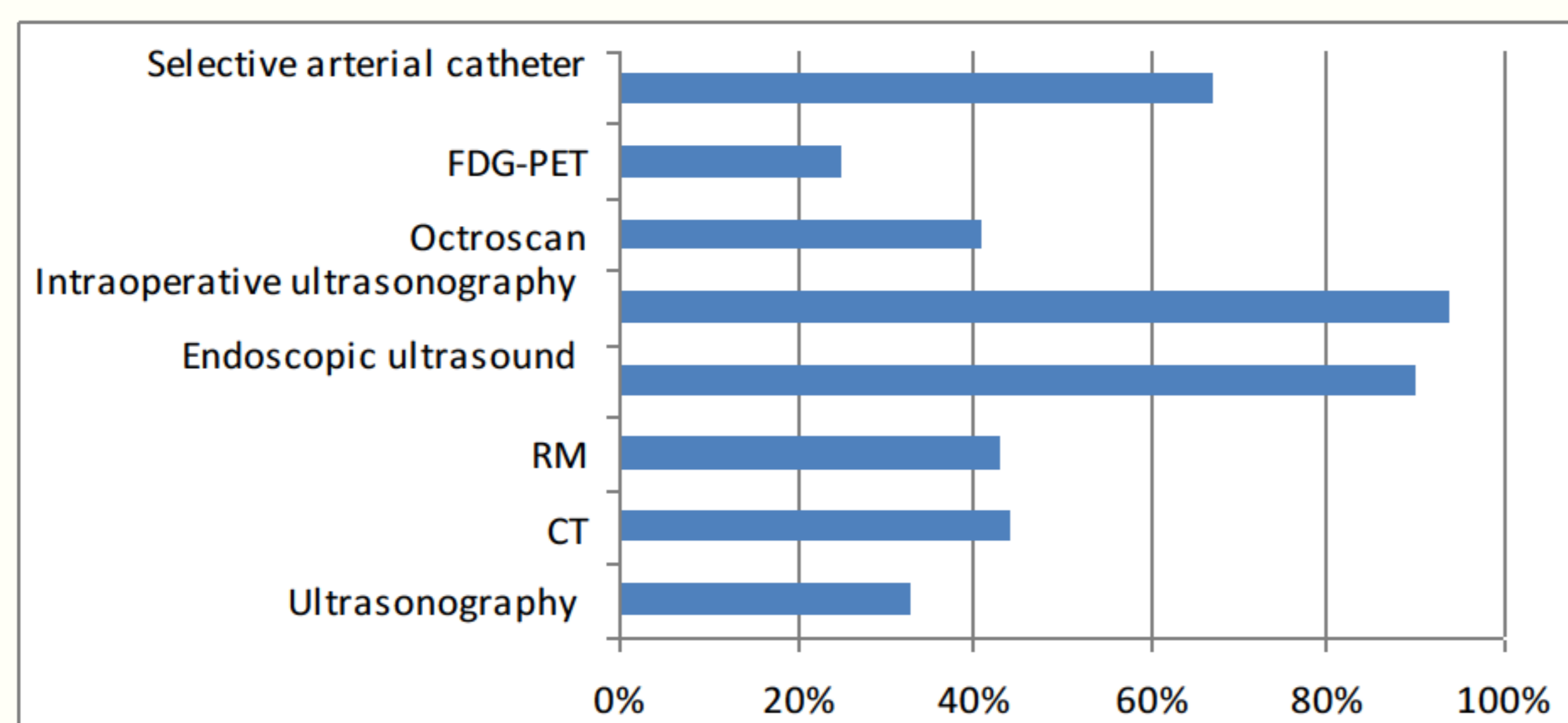


Table 2. Average values of glycemia and insulin measured during/outside hypoglycemic episodes

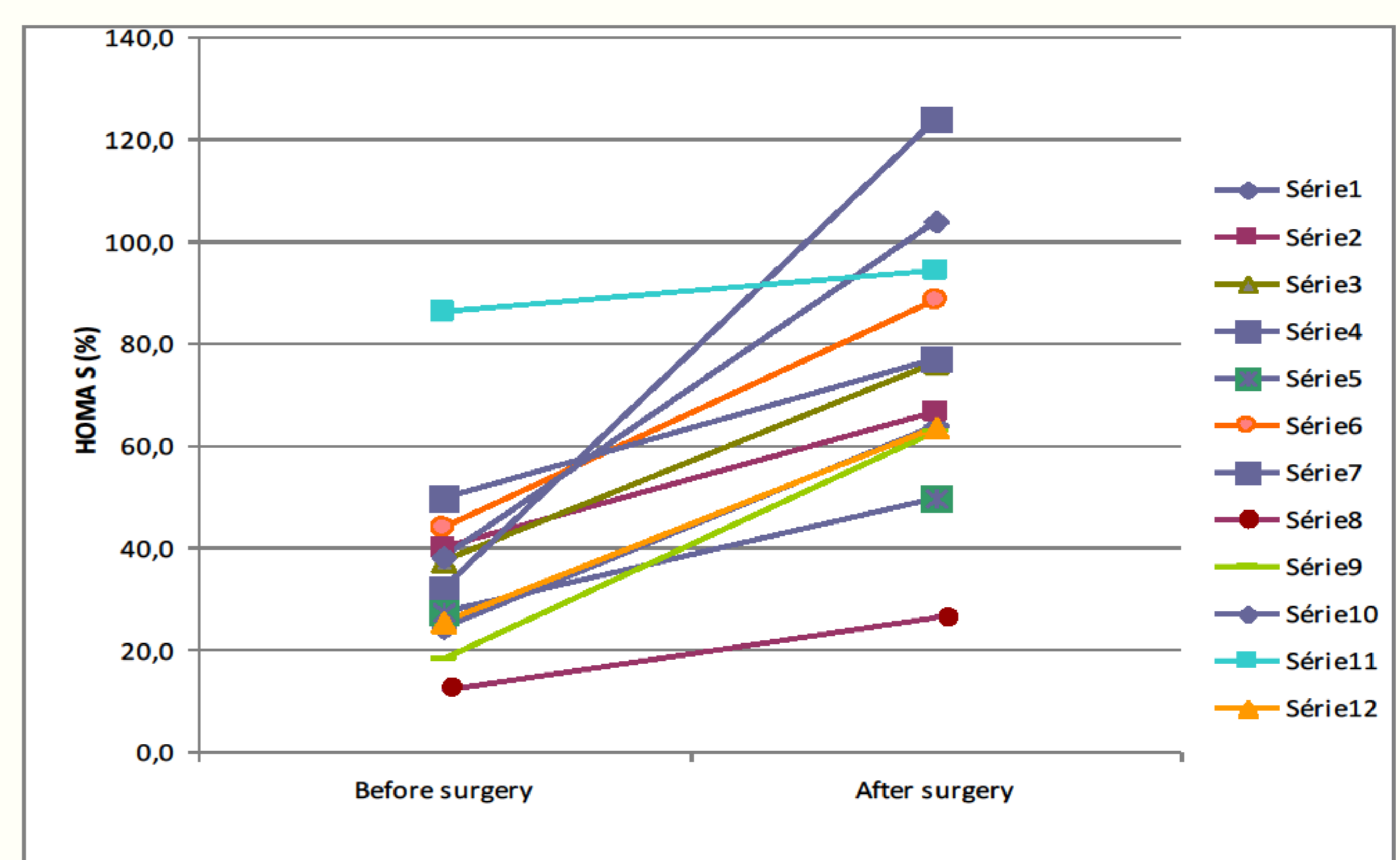
	Group	
	N	SD
Normoglycemia		
Average glycemia(mg/dL)	27	78 ± 16
Average insulin(µU/mL)	26	30.1±21.5
Hypoglycemia		
Average glycemia (mg/dL)	38	36 ± 7
Average insulin (µU/mL)	37	32.4±22.3

Table 3 . Distribution of the HOMA values (measured outside hypoglycemic episodes) before and after surgery

	Subjects	HOMA-S(%)	HOMA-B (%)
Group of 40 patients			
Values before surgery	26	38,9 ± 22,3	359,0 ± 171,5
Values after surgery	22	72,8 ± 36,7	136,7 ± 93,8
p-value		p = 0,001	p < 0,001
Subgroup of 12 patients *			
Values before surgery	12	36,9 ± 19,0	323,6 ± 143,9
Values after surgery	12	80,6 ± 18,8	114,5 ± 33,9
Difference		43,7 ± 6,1	209,1 ± 45,2
p-value		p < 0,001	p = 0,001

* subgroup of 12 patients in remission, without diabetes and with no treatment able to modify the glucose or insulin balance (paired-samples t-test; standard deviation)

Figure 3. Insulin sensitivity (measured outside hypoglycemic episodes) before and after surgery



• The general characteristics of our series are consistent with the general features reported for insulinomas in the literature.

Conclusions

- In response to chronic hyperinsulinemia, patients with insulinoma develop protective mechanisms responsible for a marked insulin resistance
- Complete surgical resection of the insulinoma fully restored normal insulin sensitivity.