

# SYMPTOMS OF GONADAL DYSFUNCTION ARE MORE PREDICTIVE OF HYPOPITUITARISM THAN NON-SPECIFIC SYMPTOMS IN SCREENING FOR PITUITARY DYSFUNCTION FOLLOWING MODERATE OR SEVERE TRAUMATIC BRAIN INJURY

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## OBJECTIVE

- The economic and logistic burden of screening for hypopituitarism following moderate/severe traumatic brain injury (TBI) is considerable.
- A key recommendation in published guidelines is to prioritize for screening those patients with symptoms suggestive of pituitary dysfunction.
- The purpose of this study was to evaluate the utility of targeted screening for hypopituitarism in long term survivors after moderate/severe TBI, using referrals on the basis of symptoms, compared with systematic screening of unselected survivors of TBI.

## PATIENTS

**Group 1 (G1):** 137 (113 males) survivors of TBI were systematically screened for hypopituitarism if they fulfilled the inclusion criteria.

**Group 2 (G2):** 112 patients (77 males) with previous traumatic brain injury and symptoms suggestive of pituitary dysfunction were referred between January 2006 and December 2013 for an endocrine evaluation in Beaumont Hospital (G 2). The reasons for referral were:

- Non-specific (n = 89, 80%);** fatigue, anergia, weight loss, inability to progress through rehabilitation.
- Female reproductive dysfunction (n= 10, 9%);** oligo/amenorrhea after TBI.
- Male reproductive dysfunction (n = 12, 11 %);** loss of libido, erectile dysfunction, loss of facial hair.
- Posterior pituitary dysfunction (n = 1, 1%);** polyuria and polydipsia.

Patients in both groups were eligible for inclusion in the study if they suffered moderate or severe TBI, as defined as GCS <14/15. All patients were 6 months or longer past their injury following discharge alive from the neurosurgical unit. The comparison in demographic and clinical data between both groups is shown in Table 1.

	Systematically screened patients(G1)	Sympomatic group (G2)	P
M:F ratio	113/24	77/35	0.017
Age at TBI (yr) <sup>a</sup>	35 (14)	31 (11)	0.009
GCS <sup>b</sup>	8/15 (IQR: 6,11)	8/15 (IQR: 5,11)	0.35
CT	Focal: 110/137 Diffuse: 27/137	Focal: 78/112 Diffuse: 34/112	0.056
Mass evacuation	75/137	60/112	0.64
Cause	RTA: 52/137 Fall: 50/137 Assault: 18/137 Other: 17/137	RTA: 63/112 Fall: 28/112 Assault: 15/112 Other: 6/112	0.023
ITU stay (days) <sup>a</sup>	10 (11)	10 (7)	0.17
Time since TBI (months) <sup>b</sup>	17 (10,26)	19 (9,43)	0.32

Table 1. Comparison in demographic and clinical data.  
a: Results expressed as mean and standard deviation (SD).  
b: Results expressed as median (interquartile-range).

## RESULTS

### PREVALENCE OF HYPOPITUITARISM IN BOTH GROUPS (G1 vs G2)

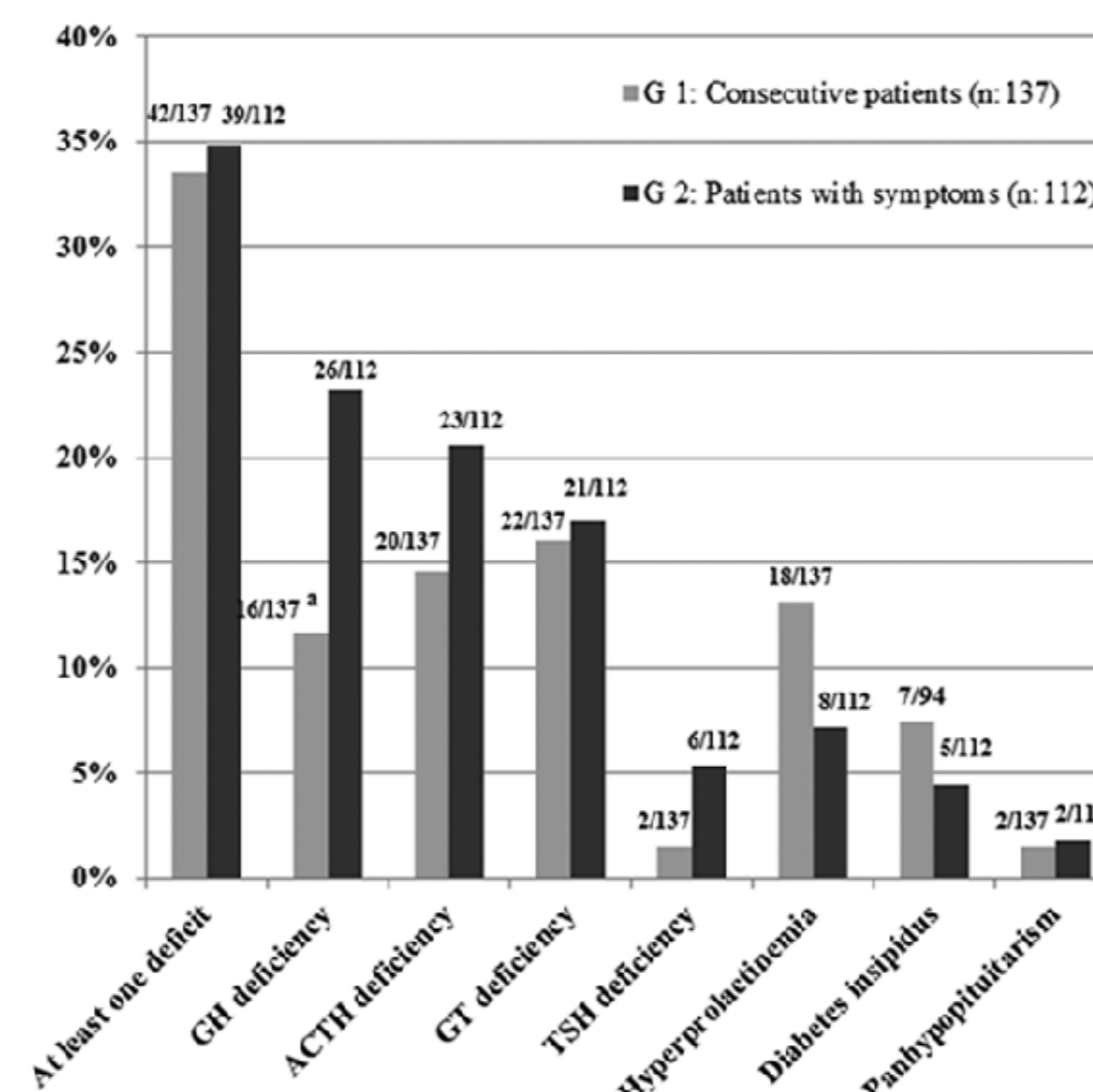


Figure 1. Prevalence of hypopituitarism in two cohorts of patients with moderate or severe TBI. Group 1(G1): systematically screened patients (n= 137) and Group 2(G2): patients referred on the basis of symptoms suggesting hypopituitarism (n= 112). GT: Gonadotropins. \*p<0.016

### PREVALENCE OF HYPOPITUITARISM IN PATIENTS EVALUATED FOR NON-SPECIFIC SYMPTOMS AND PATIENTS SYSTEMATICALLY SCREENED(G1)

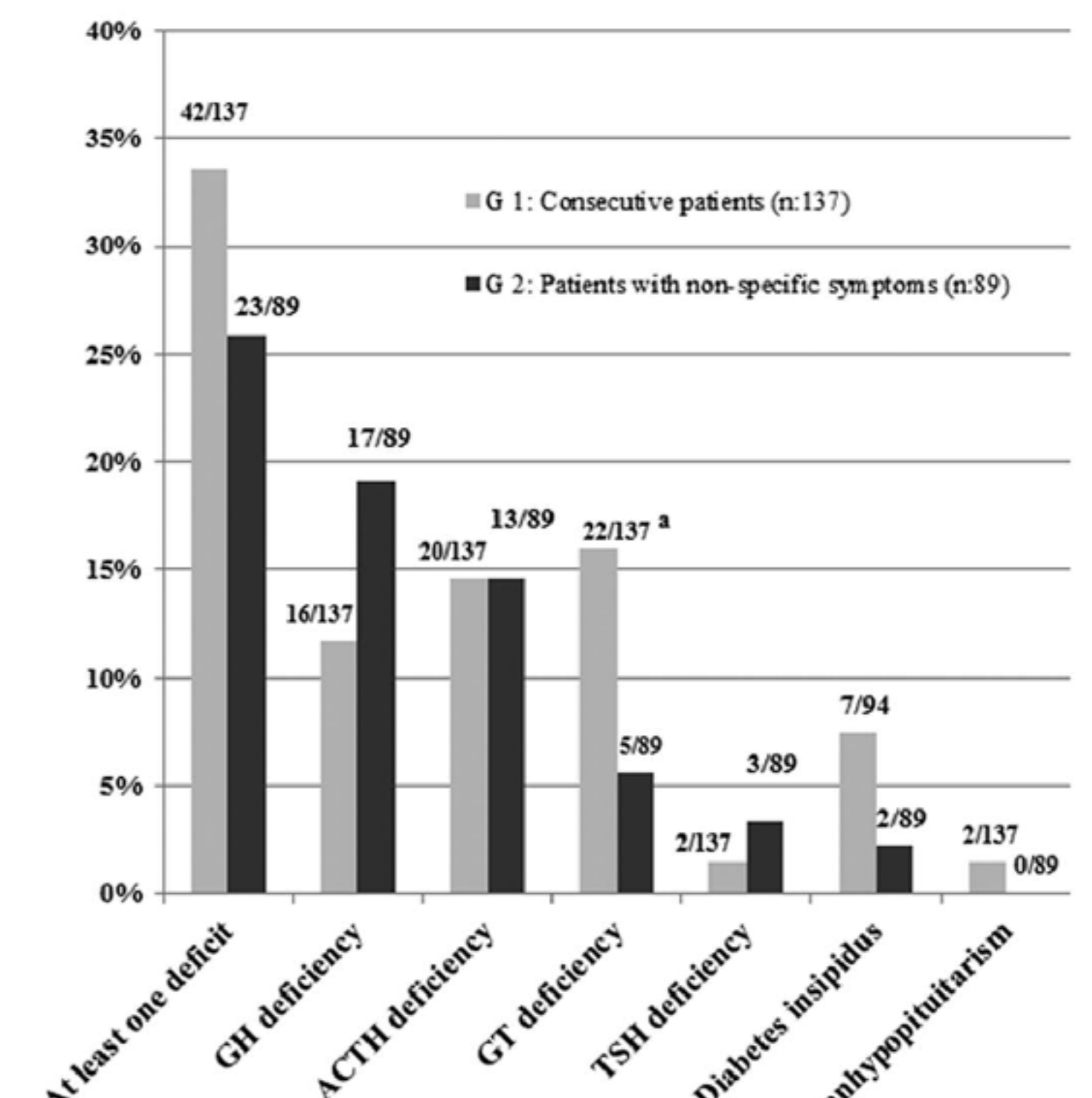


Figure 2. Prevalence of hypopituitarism in patients referred for evaluation based on non-specific symptoms (G 2, n= 89) and patients systematically screened (G 1, n= 137). GT: gonadotropin. \*p<0.018

### PREVALENCE OF HYPOPITUITARISM IN WOMEN EVALUATED FOR OLIGO/AMENORRHEA AND IN PATIENTS SYSTEMATICALLY SCREENED(G1)

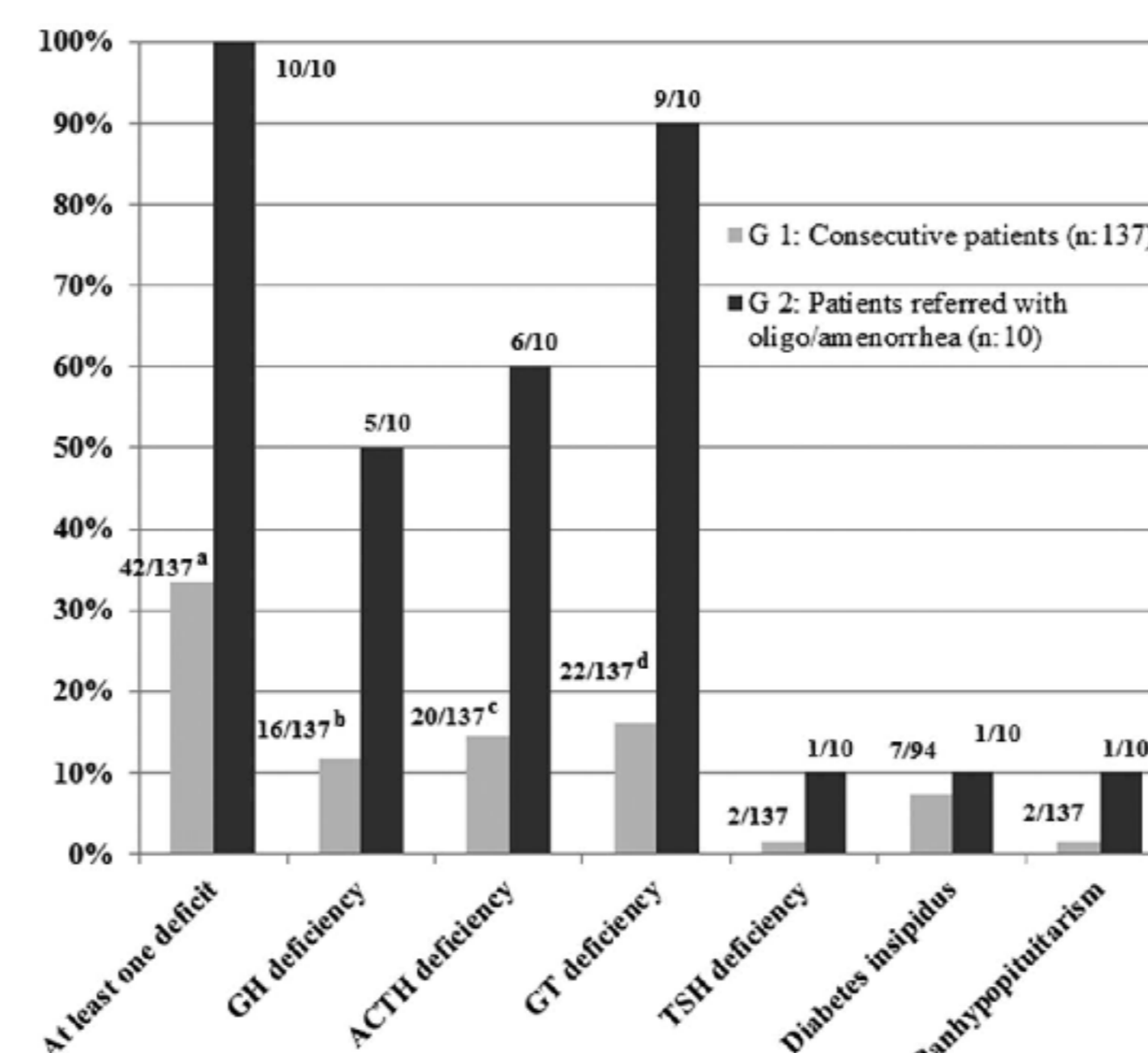


Figure 3. Prevalence of hypopituitarism in patients referred for evaluation based on menstrual disturbances (G2, n= 10) compared to systematically screened patients (G1, n= 137). GT: Gonadotropins. \* p<0.0001; <sup>b</sup>p=0.001; <sup>c</sup>p<0.0001; <sup>d</sup>p<0.0001.

### PREVALENCE OF HYPOPITUITARISM IN MEN EVALUATED FOR SEXUAL DYSFUNCTION AND IN PATIENTS SYSTEMATICALLY SCREENED(G1)

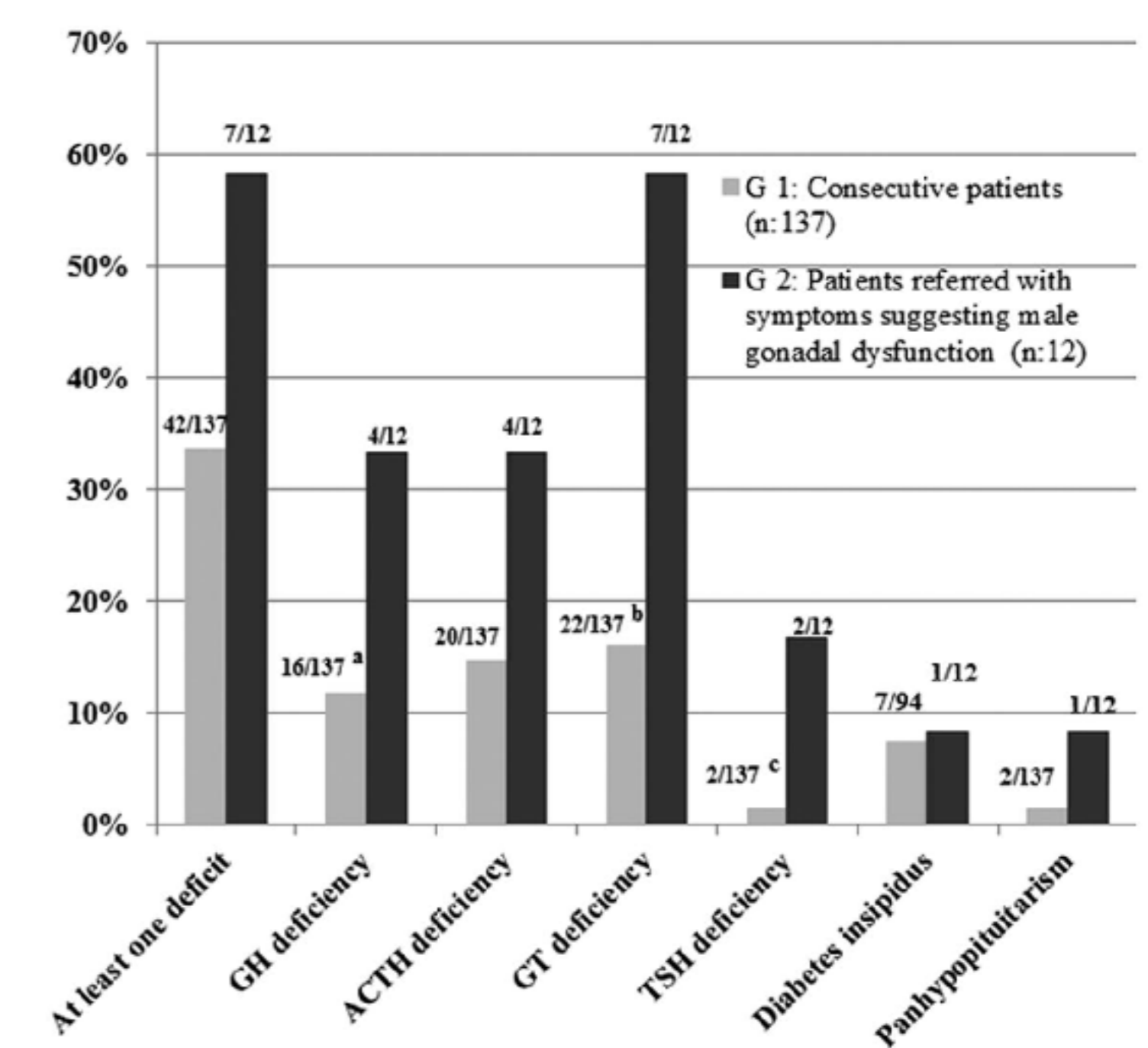


Figure 4. Prevalence of hypopituitarism in patients referred for evaluation on the basis of symptoms suggestive of gonadal dysfunction (G2, n= 12) and systematically screened patients for hypopituitarism (G1, n=137). GT: gonadotropin. \* p<0.03; <sup>b</sup>p<0.0001; <sup>c</sup>p<0.03

## CONCLUSION

- Non-specific symptoms of hypopituitarism assessed by non-endocrine physicians, are no more predictive of the presence of post-TBI hypopituitarism than unselected systematic screening. We cannot support non-specific symptoms as a rational basis for pituitary testing.
- Menstrual disturbances and male sexual dysfunction are sufficiently predictive of hypopituitarism to constitute an unequivocal justification for dynamic pituitary testing.
- The search for accurate, predictive parameters to focus dynamic pituitary testing after TBI on those who need them most continues; in view of the logistics of patient numbers, characteristics which predict who do *not* need testing may be more valuable.

