Endocrinology and Metabolism, 1997, **4** (Suppl. B), 139–142

The Burden of Hypopituitarism in Adults after Pituitary Surgery

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ABSTRACT

The burden of illness was assessed in 183 hypopituitary patients, with growth hormone deficiency, who had received pituitary surgery at the Centre Hospitalier Universitaire de Liège, Belgium. The Short-Form 36 (SF-36) was used to assess health status, and the Health and Labour Questionnaire was used to obtain data on production loss and reduced labour performance. Data on medical consumption were also collected. The overall response rate was 72%. Hypopituitary patients reported a lower health status than that of the mean population in all but two dimensions of the SF-36 (bodily pain and physical functioning). A relatively high percentage of hypopituitary patients reported being incapacitated for paid employment, and those in paid employment reported higher absence rates compared with reference data. However, while at work there was no indication that hypopituitary patients perform less well due to health problems than the average population. Healthcare costs for hypopituitary patients who had undergone pituitary surgery were higher than for the reference population.

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INTRODUCTION

Most cases of acquired growth hormone deficiency (GHD) in adulthood are due to pituitary or peri-pituitary tumours and their treatment. GHD may produce a number of characteristic signs and symptoms, such as cardiovascular morbidity [1], a reduction in bone mineral content [2] and a lack of energy and vitality [3,4]. This study set out to examine the burden of illness of a group of adult hypopituitary patients with GHD.

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PATIENTS AND METHODS

Patient selection

A series of 183 hypopituitary patients was studied retrospectively. All had undergone pituitary surgery at the Centre Hospitalier Universitaire de Liège, Belgium, between the beginning of the 1970s and April 1994. The patients were diagnosed as having GHD, defined as a peak GH response of less than 10 μU/ml during an insulin tolerance test, or the deficiency of at least one other pituitary hormone. Patients below the age of 20 years and those who had already been treated with growth hormone (GH) were excluded. The aetiological distribution of the 129 patients who completed questionnaires on quality of life and health status is given in Table 1.

Thirty-one patients received radiotherapy. Patients with thyroid and/or adrenal insufficiency were given adequate replacement therapy.

Table 1 Distribution of hypopituitary patients by diagnosis before pituitary surgery

Diagnosis	Number of patients
Non-secreting adenoma	55
Cushing's disease	16
Acromegaly	13
Prolactinoma	36
Craniopharyngioma	6
Others	3

1074–939X/97/0B0139 + 04 $12.00/0

Pharmacia & Upjohn 22nd International Symposium on Growth Hormone and Growth Factors in Endocrinology and Metabolism

Quality of life

A standard questionnaire, the Short-Form 36 (SF-36), was used for assessing health status [5]. The health status of the hypopituitary patients was compared with the average health status in groups of a comparable age and sex from the USA [6], as reference data on the health status of the population in Belgium are not available.

Indirect costs

The Health and Labour Questionnaire (HLQ) was used to collect data on production loss and reduced labour performance [7]. The total time spent absent from work in 1994 in a sample of firms representative of employers in Belgium was obtained from a previous study [8]. The number of hypopituitary patients who were incapacitated for paid employment was compared with the number of disabled persons according to the most recent statistics for Belgium from 1993 [9,10]. Subjects in paid employment were asked to indicate the impediments experienced while performing their work. In the absence of reference data for Belgium, data from a Dutch survey with the HLQ were used for comparison [7].

Direct costs

Medical consumption was recorded by questioning patients by telephone. Direct treatment costs, relating to visits to physicians and hospitalization, were based on the relevant tariffs, in the absence of data on real costs [11]. The average expenditure per person for the Belgian population was calculated by multiplying the average number of visits and hospital days by the corresponding tariffs for 1995 [12].

Statistics

A conservative *P* value of 1% was used in the analysis of the SF-36, instead of the more commonly used value of 5%, in an attempt to reduce the significance of any errors due to the use of reference data from a different cultural population – from the USA.

RESULTS

Respondents

Of the original 183 patients approached, 129 completed and returned their questionnaires for analysis. The distribution of the respondents by gender, age and employment status is given in Table 2.

Table 2 Distribution of patients by gender, age and employment status

	Number of patients
Gender	
Male	63
Female	66
Age (years)	
20–24	2
25–34	9
35–44	13
45–54	32
55–64	29
65–74	34
75+	10
Employment status	
Employed	36
Unemployed	93

Quality of life

In all dimensions of the SF-36, hypopituitary patients had lower scores than the US means, although the difference for 'bodily pain' between the patients and the US means was not statistically significant. Table 3 summarizes the scores obtained with the SF-36 for men and women. When the mean scores for hypopituitary men were compared with those for men in the USA, all health dimensions were significantly lower than average, except 'bodily pain'. The mean scores for hypopituitary women were all significantly lower than the mean for women in the USA. Similar differences were found when the results were compared with those from a Dutch reference population, which may be a more relevant comparison group than that from the USA.

As the average age of the patients was 57 years, we compared the SF-36 scores of the study group with the US reference data for the 55- to 64-year age group (Table 3). For all health dimensions, the scores were lower for the hypopituitary patients than for the US mean, although the differences for 'physical functioning' and 'bodily pain' were not statistically significant.

Indirect costs

Four patients (11%) reported that they were incapacitated for paid employment due to health problems. This compares with 4.8% of the workforce in Belgium being incapacitated for paid employment due to health problems in 1993 [9]. Ten per cent of the patients reported absence from

Table 3 SF-36 scores by gender and age for hypopituitary patients and mean scores for the US reference population; higher scores reflect a higher quality of life

	Hyopituitarism		USA		Hypopituitarism	USA
Health dimension	Male (n = 63)	Female (n = 66)	Male (n = 1055)	Female (n = 1412)	(age 55–64; n = 29)	(age 55–64; n = 269)
Physical functioning	76.9	68.1	87.2	81.5	68.9 (NS)	76.2
Social functioning	76.6	68.9	85.2	81.5	79.0	81.4
Role physical	66.8	58.1	86.6	77.7	63.7	73.7
Role emotional	70.3	62.8	83.3	79.5	72.0	80.3
Mental health	64.2	58.2	76.4	73.3	63.2	75.0
Vitality	51.4	46.2	63.6	58.4	48.5	60.4
Bodily pain	72.4 (NS)	62.9	76.8	73.6	63.7 (NS)	67.5
General health	54.9	57.3	73.5	70.6	56.1	64.6

All differences between hypopituitary patients and the reference population were significant ($P < 0.01$) except where indicated (NS).

work. The mean time spent absent from work was nearly 20 days/year (Table 4), which compares with nearly 9 days/year for the reference data [8].

The basis for these estimates is weak, however, as the number of patients having a paid job in the sample was only 36. Additionally, data on the gross earnings by age and sex were lacking, so quantification of the production losses is based on average gross earnings. Taking into account these restrictions, the indirect costs per working patient amounted to nearly US$ 3000/year. Of the respondents in paid employment, 97% reported no reduced efficiency at work due to health problems. There was no indication of a difference in performance at work between the hypopituitary patients and the reference group.

Table 4 Mean age, mean duration of working week and absence from work for hypopituitary patients

Mean age (years)	Mean duration of working week (hours)	Mean time spent absent from work (days/patient/year)	n
48	36	19.8	36

Direct costs

Hypopituitary patients had higher healthcare costs for visits to the general practitioner, visits to a specialist and hospital admissions than the reference population (Table 5).

Table 5 Mean number of visits to the general practitioner and specialists and number of days spent in hospital by hypopituitary patients compared with the mean utilization and expenditure per person in Belgium (in 1995)

	Hypopituitary patients	Belgian population
General practitioner		
Mean number of visits	9.6	2.1
Cost (US$)	121	26
Specialist		
Mean number of visits	6.5	1.5
Cost (US$)	156	27
Hospitalization		
Mean number of days	3.5	2.3
Cost (US$)	1145	843

DISCUSSION

In this analysis, hypopituitary adults who had undergone pituitary surgery for differing aetiologies were compared with healthy reference groups. The differences compared with the normal population cannot be attributed entirely to GHD, as all the patients received regular medical follow-up as a result of their surgery. Moreover, part of the study population had suffered previously from Cushing's disease or acromegaly, which are themselves incapacitating diseases. Finally, 31 patients needed radiotherapy, which may also lead to specific symptomatolgy. Further studies are therefore needed to compare patients who have undergone pituitary surgery either with or without GHD, with both groups consisting exclusively of patients with non-secreting adenomas and prolactinomas, but excluding Cushing's disease and acromegaly. Such studies would indicate more precisely the contribution of GHD to the burden of illness for these patients.

In several studies, the quality of life of patients following pituitary surgery and of patients with GHD has been assessed using the generic Nottingham Health Profile or the disease-specific questionnaire for adult patients with GHD (Assessment of GHD in Adults; AGHDA; developed by Galen Research with

funding from Pharmacia & Upjohn). To our knowledge, the generic SF-36 questionnaire has never been applied to an adult population with GHD.

Our results regarding the number of days absent from work were in accordance with the amount of sick leave recorded in a period of 6 months in a group of 148 patients with GHD before inclusion in a therapeutic trial of GH: 22 days/patient/year [Verhelst *et al.*, unpublished data].

The estimates of direct costs should be interpreted with caution for several reasons. First, in comparing the average number of visits and days spent in hospital by the hypopituitary patients with the Belgian reference population, it was impossible to correct the latter for variance in utilization by age and sex, because of lack of detailed data. Secondly, the calculation is based on charges, instead of real costs, which may cause over- or underestimation. Additionally, the direct-cost estimation is restricted to utilization of a limited number of healthcare provisions. Finally, information collected by interview is probably less reliable than data obtained from healthcare providers or insurance companies.

ACKNOWLEDGEMENTS

Dr Ch Rossinfosse and Mrs I Aprile are gratefully acknowledged for their assistance in screening patient files and in contacting patients and collecting questionnaires. Dr D de Graeve kindly provided support in finding Belgian reference data on sick leave and disability.

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