Quality of Life in Growth Hormone Treated Adults

Kazue Takano, Toshiaki Tanaka, Tomohiro Saito and the Members of the Committee of the Study Group for Adult GH Deficiency, Foundation for Growth Science in Japan

Department of Medicine, Institute of Clinical Endocrinology, Tokyo Women's Medical College (K.T), Division of Endocrinology & Metabolism, National Children's Hospital, and Endocrine Research Laboratory, National Children's Medical Research Center (T.T), Division of Environment and Epidemiology, National Children's Medical Research Center (T.S), Tokyo, Japan

Abstract. We surveyed the quality of life of adult patients with growth hormone (GH) deficiency, who ceased GH therapy before the age of 20. We sent questionnaires to 1,116 patients and their physicians concerning their socio-economic status and medical background. Return rates were 64% and 69%, respectively. The final height was above -2 standard deviation in 61% of the patients. The distribution of occupation and income were quite similar to those in the general population. Patients with a final adult height below 155cm in males or below 140cm in females felt a disadvantage in getting jobs and in finding marriage partners. The CMI revealed slight psychological problems in these patients.

Key words: GH-treated adult, QOL of GHD adults, questionnaire survey, socio-economical status of GHD adult, CMI.

Introduction

Growth hormone (GH) administration is the essential and most effective treatment in patients with GH deficiency. From 1974, we treated Japanese patients with GH prepared from the human pituitary gland at a low dosage of 0.2-0.4IU/kg/week. The treatment ceased when the height reached 155cm in males and 150cm in females. This policy was maintained until recombinant GH preparations came on to the market in 1986 (1). We made a survey of the benefit of GH treatment to these patients in their life. This report summarises the results of our survey of 1,116 patients conducted from September, 1990 to March 1992.

Materials and Methods

The questionnaire to the patients referred to their present physical condition including height, weight, health problems, school and occupational career, socio-economic and marital status, and their evaluation and comments on the therapy. The Cornell Medical Index (CMI) health questionnaire with modifications (2) was also used to assess their physical

Correspondence: Dr. K. Takano, Department of Medicine, Institute of Clinical Endocrinology, Tokyo Women's Medical College, 8-1, Kawada-cho, Shinjuku-ku, Tokyo 162 Japan
and mental states. All the patients who received human growth hormone were registered with the Foundation for Growth Science in Japan when they started treatment, and about 1,500 patients had reached adulthood before December, 1989. The questionnaires were sent to 1,116 of these patients through their physicians, and 709 patients, 514 males and 195 females, returned the anonymous questionnaires to the survey office.

Separate questionnaires on the medical background of the patients were also sent to physicians in charge, and 769 questionnaires, 564 of male and 205 of female patients, were returned. The questionnaires returned by the patients and by the physicians were linked with the help of the date of birth and sex of the patients, the name of the hospital, and occasionally the patient’s name written on the envelope. Five hundred and thirty-nine cases, 390 male and 149 female patients, were linked.

In the analysis we compared the answers by the type of deficiency (GH isolated and multiple pituitary hormone deficiency) and the final height of the patient, and when available we compared the questionnaire items with those of the general population. Here we classified the patients by their final height as follows: very short, below 155cm in males and below 140cm in females; short, between 155 and 165cm in males and between 140 and 150cm in females; normal, above 165cm in males and above 150cm in females. In the analysis of the CMI, we used as controls male workers of 30±8 years of age (N=748) (3) and female college students of 18±0 years of age (N=345) (4). Statistical tests employed were the X²-test, student’s t-test and significance test for the difference in proportions.

**Results and Discussion**

The physicians’ answers to the questionnaires revealed the following. Eighty-six percent of the patients suffered from idiopathic growth hormone deficiency and 13% from secondary GH deficiency. Thirty-two percent of patients had isolated GH deficiency (IGHD) and 65% GH deficiency with other pituitary hormone deficiency (multiple pituitary hormone deficiency: MPHD). Eighty-two percent of the patients received a dose of 0.2–0.4IU/kg/week, which was considered to be less than the present therapeutic dose of 0.5IU/kg/week. These figures indicate that the treatment in most of the patients was insufficient, and this was due to the shortage of human GH preparations. The results of the questionnaire need to be interpreted with this point in mind.

The age of the patients at the time of the survey ranged from 18 to 48 years, and 86% of them were in their 20s. The final height ranged from 120 to 180cm, and in both sexes 61% were above -2 standard deviation from the mean of the Japanese adult population: above 159cm in males and above 148cm in females. The mean of the final height for males was 157cm in IGHD and 162cm in MPHD (Fig. 1); that for females was 144cm in IGHD and 151cm in MPHD (Fig. 2). Thus, in both sexes, the final height was much shorter in IGHD. This is probably due to the early onset of puberty in IGHD. These findings are similar
Quality of Life in Growth Hormone Treated Adults

Fig. 2. Final height distribution of female patients with GH deficiency. □; IGHD, ■; MPHD, --- mean ±2SD of height. The classification of height: very short < 140cm, short 140-150cm, normal ≥150cm.

Fig. 3. School career of patients with GHD as compared to whole population in Japan.

Fig. 4. Occupation of patients with GHD. (upper: male, lower: female).

Fig. 5. Feeling disadvantage in getting jobs because of short stature.

to those reported previously (5,6,7). In 12% of the patients the end of their school career was junior high school, and this percentage is much higher than the national figure, which is about 4% (Fig. 3). This was not because of their short stature, but most likely because of underlying diseases. The percentage of college graduates in the patients was lower than the national figure. The distributions of occupation (Fig. 4) and income were quite similar to those in the general population. There was no association between height and annual income. Thirty-five percent of the patients changed employment, and this is close to the figure among the general population of the same age group. Among the male patients with final
height below 155cm, 40% felt discrimination against short stature in finding jobs (Fig. 5). Among the female patients with final height below 140cm this figure was 50%.

The number of patients who married was 30 for males and 32 for females, that is 6.0% and 17.2% respectively. These percentages are lower than the those of the general population of the same age group (Fig. 6). The percentage of patients with IGHD who married was 4 times more than in those with MPHD, in both sexes. Both groups of patients had children. Thirty-eight percent of the male and 22% of the female patients felt a disadvantage in finding marriage partners because of their short stature (Fig. 7). Among single patients many expressed anxiety about sex in marriage, particularly MPHD male patients of short stature. Overweight, above 20% of the standard weight for height, was observed in 12% of male and 10% of female patients (Fig. 8).

Eighty-three percent of patients ap-
Quality of Life in Growth Hormone Treated Adults

Fig. 10. CMI profiles of patients with GHD as compared with controls. The rates of "yes" responses are shown. (upper panel male, lower panel female).

Fig. 11. Neurotic tendency in male patients assessed by CMI (class IV).

precipitated the GH treatment. In particular, the males over 165cm and females over 150cm were satisfied with their present height (Fig. 9). The main psychosocial problems were immature sexual development, anxiety about marriage, fatigue, overweight and inability to reach things. As far as GH treatment was concerned, they complained about the pain of injection but recommended others to start GH treatment as early as possible to achieve a good final height. CMI profiles (Fig. 10) indicated a significantly higher rate of "yes" responses in sections J (presence of disease), M (maladjustment) and Q (anger) in male patients when compared with reference workers as controls (7.4% vs. 4.5%, 18.4% vs. 13.1%, 18.6% vs. 13.1%, respectively). In female patients, a higher rate of "yes" responses was observed in sections J and K (past history of disease) (8.9% vs. 3.4%, 8.4% vs. 3.5%, respectively). Neurotic tendency, as defined by Fukamachi (2), was observed in 11% of male patients with MPHD, which is higher than that observed in the general population (1~4%) (Fig. 11). In other items of the CMI no difference was observed as compared with the controls.

There are some reports concerning the quality of life (QOL) of adults who ceased GH therapy in childhood. Dean et al (8) interviewed 116 adult patients with GH deficiency, aged between 18 and 38 years, across Canada. They had been treated with GH during childhood. The investigators focused mainly on the social adjustment of these patients and interviewed them on education, employment and marital status. They found that although their height had increased after GH treatment, the overall outcome was unsatisfactory since the rate of unemployment was almost threefold greater than expected, and the rate of marriage fivefold less. These values were greater than ours. Recently in 1990, Rosen et al. (9) surveyed hypopituitary patients treated with replacement hormone therapy, excluding GH. They reported that the mortality of these patients was twofold that of the general population. They concluded that the higher mortality of these GH-deficient adults might be related to the GH deficiency. Several groups studied the clinical symptoms and signs of GH-deficient adults (10-20). The signs consisted of reduced lean body mass, reduced extracellular fluid volume, reduced bone mineral density, increased body fat, reduced muscle strength and other signs. The main clinical symptoms were reduced energy and
vitality and increased anxiety, which led to a poor quality of life. They also reported that these clinical symptoms and signs improved dramatically with GH replacement therapy.

Our study did not enter into the details of the quality of life of each patient. However, we came to the conclusion that most GH-treated adults in Japan adjusted themselves well to their psychosocial environment. There are, however, disadvantages for these patients in getting jobs or in finding marriage partners. We need further study to find out the best way to increase the final adult height, to ensure sexual development and finally to improve the quality of life of these patients.

References

17. Whitehead H.M., Boreham C., McIlrath E. M., et al.: Growth hormone treatment of
