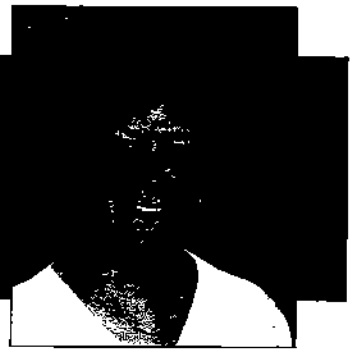
1) D 52 : FM - GHD

Adult Growth Hormone Deficiency in Fibromyalgia

Growth hormone deficiency was found in many fibromyalgia patients in a community rheumatology practice.



Growth hormone deficiency in fibromyalgia patients has been acknowledged and studied since 1992 when Dr. Robert Bennett reported his findings. In this recent study, Dr. Thomas Romano looks at the frequency of fibromyalgia and growth hormone deficiency in a solo private practice. The results of his investigation, elucidates the need for FM-treating clinicians to become more knowledgeable about this important area of neglected treatment in this patient population.

— Rae Marie Gleason

By Thomas J. Romano, MD, PhD

Fibromyalgia (FS) is a very common chronic pain condition.[1,2] It varies in intensity depending on numerous factors including co-morbidities, weather changes and activity level. It may be difficult to treat and can be the source of frustration for clinician and patient alike. In fact, the term "resistant fibromyalgia" has been coined for such situations.[3] FS has been shown to co-exist with rheumatoid arthritis, systemic lupus erythematosus and osteoarthritis.[4]

In 1992, Robert Bennett reported that many of his FS patients had symptoms suggesting adult growth hormone (GH) deficiency and that they had low serum levels of a byproduct of GH, Somatomedin-C.[5] Other academic centers reported similar findings.[6-8] To date there has been no large study of FS patients treated in a non-academic setting for adult GH deficiency. This communication explores the coexistence of FS and GH deficiency in a solo private practice setting.

Patients and Methods

Over 13 years, 246 adults who met American College of Rheumatology FS criteria[9] were tested for adult GH deficiency. Testing was based on a history of unexplained weight gain, decreased stamina, labile mood, fatigue and decreased libido. Often, centripetal obesity and deconditioning were present.

One hundred ninety-seven women (mean age 44 years; range 21-52) and 49 men (mean age 49 years; range 22-54) were tested for GH deficiency by measuring serum insulin-dependent growth factor one (IGF-1). GH has a very short half life, but its byproduct, IGF-1 has a half life of 20 hours. IGF-1 is a useful marker for growth hormone status.[10] Random serum IGF-1 levels are more likely to reflect GH secretion than direct GH levels. Serum samples were sent to Quest Diagnostics (Pittsburgh, PA) for analysis.

Repeat IGF-1 levels were obtained 3 to 9 months after the patients were treated with human growth hormone. The preparations used were either Humotrope® (Lilly), Genotropin® (Pfizer), or Nutropin® (Genentech). Visual analog scales (VAS) were used to assess pain levels and fatigue levels.

Of the 246 FS patients studied, 180 had developed FS post-trauma, 41 had idiopathic FS, and 24 had FS secondary to other medical problems such as osteoarthritis, chronic lung disease, Sjogren's Syndrome, etc.

Of the 246 FS patients, 220 of them—comprised of 180 women (mean age 43 years; range 21-50 years) and 40 men (mean age 48 years; range 22-50 years)—had low levels of IGF-1 for age, defined as less than 90% of ideal IGF-1 levels. They were referred to an endocrinologist for intravenous GH stimulation testing utilizing either insulin or arginine. One hundred fifty-five patients did not respond adequately to IV GH stimulation with GH levels less than 5ng/ml during the testing. Daily subcutaneous injections of GH were prescribed for all of the above 155 patients and also 35 other FS patients who had extremely low IGF-1 levels (defined as less than 50% of ideal IGF-1 levels) for a total of 190 patients.

One hundred seventy patients were able to get GH treatment for at least six months. Twelve patients could not afford the treatment and eight patients had an aversion to self-administering GH.

TABLE 1. Nominal IGF-1 levels vary with age and can be calculated.

For any given age, one can estimate the ideal IGF-1 level for that age.

Formula:
Age – 30 = N
3 x N = 3N
Ideal level = 280 – 3N

Example for age 45:
45 – 30 = 15
3 x 15 = 45
Ideal level = 280-45 = 235

The nominal IGF-1 level would therefore be 235ng/ml for a 45-year-old.

TABLE 2. Summary of the present and previous studies.

Study	Number of Patients	Location
Bennett R et al[5]	70	University
Bagge E et al[6]	10	University Hospital
Jacobson S et al[7]	17	University
Bennett R et al[8]	500	University
Griep E et al[13]	10	University Hospital
Paiva E et al[14]	20	University
Dinser R et al[15]	60	University
Yuen K et al[16]	77	University
This Study	246	Private Practice

Results

The average IGF-1 level for the 180 women was 140ng/ml (58.8% of the expected average level of 238ng/ml). Average IGF-1 level for the 40 men was 132ng/ml (59.2% of the expected average level of 223ng/ml). Table 1 illustrates a method for estimating ideal IGF-1 levels for any given age based on Bennett's study.[5]

After treatment with Human GH (Somatotropin; mean dose 0.35mg subcutaneous daily), there was marked improvement in quality of life, energy level, and pain scores. Serum IGF-1 levels paralleled clinical improvement. In the 180 women, mean IGF-1 rose from 140 to 224ng/ml and, in the 40 men, mean IGF-1 rose from 132 to 218ng/ml. These differences were highly statistically significant at $p<0.001$ using comparison of means test.

Mean VAS pain scores for all GH-treated FS patients fell from 7.2 to 5.7 and quality of life indicators also improved. 85% of treated FS patients reported that their quality of life as improved, ten percent reported no change, and 5% reported that it was worse. Six patients had to discontinue GH due to either edema or an increase in overall myalgias.

Discussion and Conclusion

It stands to reason that successful treatment strategies for FS patients must address other medical conditions that may also be present. This concept was explored in detail by Travell and Simons in regards to myofascial pain syndrome.[11] They aptly termed these co-morbidities "perpetuating factors." GH deficiency and FS share many common symptoms including fatigue, weight gain, cognitive dysfunction, and mood alterations. Thought to be rare, adult GH deficiency may go unnoticed as it is rarely, if ever, tested.

A diagnosis of adult GH deficiency is thus often missed and the opportunity to correct a significant, perhaps critical, perpetuating factor is lost. Effective treatment of adult growth hormone deficiency typically results in clinical benefit in general.[16,17] This also is true if the GH deficiency is present in patients with FS. As shown by Bennett at the University of Oregon over 10 years ago[12] and shown in this study, treating the GH deficiency in FS patients effectively results in improvement in pain levels, stamina, and fatigue.

Unlike previous studies (see Table 2), this study of 240 patients describes the coexistence of GH deficiency and FS in patients in a community private practice setting as opposed to a university or university hospital setting. This suggests that the prevalence of GH deficiency in FS is relatively high and that it should be seriously considered in FS patients whose symptoms and physical characteristics suggest GH deficiency. To miss the diagnosis of GH deficiency and allow this condition to go untreated would mean needless suffering for many FS patients. ■

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(HIT Advisor continued from page 64)

In The Next Article: Mobile Phone Updates for Health Care

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Resources

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