

Prevalence of Growth Hormone Deficiency in Fibromyalgia

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Introduction

Fibromyalgia (FM) is a common (1), chronic (2), and painful disorder (3), that can be debilitating (4) which has significant socioeconomic implications including disability benefits, litigation and work-day loss (5-7). The American College of Rheumatology (ACR) formulated criteria in 1990 (8) and 2010 (9) to aid the clinician in diagnosing and classifying FM. Treating FM patients can be difficult. The term "resistant fibromyalgia" had been coined for such situations (10), particularly if co-morbidities exist which can affect prognosis and interfere with the treatment of FM. These include rheumatoid arthritis, systemic lupus, erythematosus and osteoarthritis (11), endocrine disorders such as growth hormone deficiency (12), electrolyte problems such as magnesium deficiency (13) and neurological problems such as nocturnal myoclonus (14) to name a few. Recognition of co-morbidities, therefore, is essential for optimal treatment. This study strived to determine the prevalence of FM. This prevalence has heretofore not been determined.

Materials and Methods

Seventy-eight (78) consecutive female FM patients evaluated in a private rheumatology/pain management practice between 2012 and 2015 were studied. All fulfill the ACR 1990 and 2010 criteria for FM. Mean age was 45 years (range 20-68). To determine the GH status of these patients, serum IGF-1 levels were measured at their initial visit. Direct measurement of GH was impractical since GH has a very short half-life but IGF-1 has a much longer half-life and therefore is a useful marker of GH status. Serum samples were frozen and sent to Quest Diagnostics (Pittsburgh, PA, USA) for analysis. FM patients with low-for-age IGF-1 were referred to an endocrinologist who ordered intravenous GH stimulation testing with either arginine or glucagon. Failure to produce GH when so stimulated determined the diagnosis of adult GH deficiency. Peak GH ≤ 3 mg/L (using glucagon) or GH ≤ 4 mg/L (using arginine) signified failure to stimulate adequately (15).

Ideal IGF-1 Formula

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

FORMULA:

Age-30=N

3 X N=3N

280-3N= Ideal IGF-1 level

For Example:

If age =45

45-30=15

15 X 3=45

280-45=235

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

Results

Of the 78 FM patients studied, 70 had low-for-age IGF-1 levels. The mean IGF-1 level for the FM patients was 133 ng/ml. This was significantly lower than the expected mean of 235 ng/ml ($p < 0.0001$). All 70 were referred for the IV GH stimulation test. Forty-eight (48) took the test; 22 could not for logistical reasons. Of the 48 that were tested, 44 (92%) failed to be stimulated to produce an adequate amount of GH. Of the 78 FM patients, at least 56% satisfied accepted criteria for adult GH deficiency.

Conclusions

Based on this study one can conclude that a very high percentage of female FM patients have adult GH deficiency. If a female FM patient complains of fatigue, decreased stamina and weakness, as well as exhibiting centripetal obesity, deconditioning and/or poor muscle strength, she should be evaluated for adult GH deficiency.

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