Seric levels of IGF-1 in elderly people


ABSTRACT: One of the biggest problems faced by the elderly people is the lack of strength originated by the reduction of muscle mass, which is harmful for his/her independence. Many of these alterations are associated to endocrine abnormalities acquired in the process of senescence, as the reduction of the seric levels of the growth hormone (GH) and the growth of insuline-1 (IGF1). Both are associated to thin mass’ loss, the decrease of the protein synthesis and the increase of the adipose mass in elderly people and adults that present deficiency in axis GH/IGF-1. The objective of this study is to investigate the seric levels of IGF-1 in 73 inactive elderly of both genders (60-90 years old/M=80.09).The results showed that the seric levels of IGF-1 of both genders were inside the reference levels and did not present differences. The benefits of higher IGF-1 levels in the elderly and the knowledge of means to increase their synthesis and release become evident.

Keywords: elderly, IGF-1, protein synthesis

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INTRODUCTION

The growth hormone (GH), or somatotropin, is a protein that stimulates body’s tissue growth, to increase corporal protein synthesis and also uses the retained fat and preserves carbohydrates (GUYTON e HALL, 2002).

Many GH effects happen indirectly through the growth factors (IGFs). The IGF-1 is the most important one and is produced by the hepatic cells, showing a structure which is similar to insulin, with its receptors found in many tissues and similar to the insulin’s receptor (MOXLEY, 1994).

IGF-1’s action is exerted locally and, more largely, in the secreted form (MORLEY e col., 1997). The IGF-1 can be synthesized in the same cell in which it acts (autocrine) or in neighbor cells (paracrine) (ELIAKIM e col., 2000; MORLEY e col., 1997; WELLE, 2002; WYNGAARDEN e col., 1993). Therefore, IGF-1 levels may not reflect only one measure of GH, since the IGF-1’s local expressions in many tissues are GH-independents (ARVAT e col., 2000).

The IGF-1 is found going round in the free form and linked to carrier proteins (IGF binding proteins – IGFBPs) and form a complex which is influenced by deficient or increased states of GH (ARVAT e col., 2000).

According to Morley & col. (1997) and Welle (2002), the IGF-1 has an important paper in the cerebral function, in the myelin synthesis raising, in neuronal development and growing, in the protein’s synthesis raising and also neurotrophic effects, which increases muscular fiber reinervation.

This growth factor stimulates the condroitin sulphate’s incorporation (bone composition). This important function is characterized by the impulse towards the osteoblasts activity’s formation and bone matrix formation (ARVAT e col., 2000).

Low IGF-1 and IGFBP-3’s levels in elderly people are associated to obesity, corporal composition’s changes, protein synthesis, decrease in the number of myocyte, collagen and fibrosis accumulation, deterioration in the myocardium conduction’s system and in the adrenergic receptors’ function, endothelial dysfunction and endurance capability’s reduction, between others (BLACKMAN e col., 2002; CORPAS e col., 1993; DAM e col., 2000; KHAN e col., 2002; LANGE e col., 2001).

It is very difficult to visualize all the levels of human aging problems. An effort has been made to identify through the studied, the keys of many frequent limitations in men’s aging.

According to Capolla & col. (2001) and Morley & col. (1997), the reduction of GH pulsatile liberation inhibits the IGF-1’s liberation. The nutrition, the physical activity’s levels, diseases, alcohol ingestion, insulin’s resistance and the hepatic function are factors that can spoil this hormone’s liberation.

The relevance of IGF-1 seric levels in the aging process keeps being an enigma.

In this context, many investigations about the alterations in the GH/IGF-1 axis with the aging process are necessary aiming at confirming the benefits and limitation of IGF-1 therapy in elderly people.

OBJECTIVE

The objective of this study was to verify the seric levels of IGF-1 in elderly people.

METHODOLOGY

Sample’s Characterization

This study has used 21 male and female sedentary elder, between 60 and 90 years old. This sample is composed of 12 women, with an average of 73.3 years old, corporal weight around 56.90 kg and medium height of 1.51 cm. The male group is formed of 9 individuals, with an average age of 69.90 years old, corporal weight around 80.65 kg and average height of 1.61 cm.

Procedures

Radimmunoassay (RIA) coated-Tube-Irma Kit diagnostic use DSL-5600 (Diagnostiv Systems Laboratories) was used for IGF-seric levels verification.

The selected group has signed a document of participation’s concession, in agreement with October 10th, 1996, resolution 196.
of the National Health Counsel for the ethic norms for researches involving human beings.

RESULTS AND DISCUSSION

For a better understanding, the results are shown in chart 1.

Based on these results, IGF-1 seric levels of both genders have been into the reference levels and have not presented differences.

Many studies have been relating IGF-1 seric levels in elderly people with different variables.

Huayllas & col. (2001) found IGF-1 levels inside de reference’s zone in thereabout 156 of the 225 elders (148 men and 77 women), around 70 and 91 years old, who formed the sample. GH levels were higher than IGF-1 levels, especially in women. For this purpose, two justificative can be presented: the acute stress caused by morning’s collect (in fasting) or hormonal resistance.

There are many alternatives to raise IGF-1 seric levels. Some studies have highlighted that bodybuilder and endurance exercises may alter the GH temporal release pattern during the night and raise the detection of IGF-1 circulation (SINGH & col., 1999; HAKINEN et al., 2001; HURLEY e ROYH, 2000; NINDL & col., 2001).

In a study accomplished by Singh e col. (1999) with 13 men and 13 women between 72 and 98 years old, the strength training was used aiming to increase IGF-1 seric levels. The results showed a 500% (approximately) growth of this hormone in the blood circulation, which evidences its role in the muscular growth and development.

Tissandier & col. (2001) has verified the influence of endurance training in sedentary elders. This study confirmed metabolic, cardiorespiratory and anthropometric benefits associated to higher IGF-1 seric levels, together with other anabolic hormones in trained elderly people.

Endocrine changes associated to GH decline are similar to the Endocrine Reviews. v. 14, n. 1, p. 20-35, 1993.

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