Short-term, supra-physiological rhGH administration induces transient DNA damage in peripheral lymphocytes of healthy women.

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Purpose: While a good safety for recombinant human growth hormone (rhGH) therapy at replacement doses is recognized, a possible link between high concentration of the GH-IGF-I axis hormones and side negative effect has been reported. The aim of this pilot study was to assess whether a short-term exposure to supra-physiological doses of rhGH may affect DNA integrity in human lymphocytes (PBL).

Methods: Eighteen healthy *Caucasian* female (24.2±3.5 years) were randomly included in a Control (*n*=9) and rhGH administration group (*n*=9, 3-week treatment). DNA damage (comet assay), chromosomal breaks, and mitotic index in phytohemagglutinin-stimulated PBL were evaluated before (PRE), immediately (POST), and 30 days (POST30) after the last rhGH administration (0.029 mg kg^{-1} BW; 6 days/week), together with serum IGF-1 and IGFBP-3 concentrations.

Results: rhGH administration increased IGF-I, without evidence of persisting IGF-I and IGFBP-3 changes 30 days after withdrawal. Total DNA breakage (% DNA in tails) was not significantly different in subjects treated with rhGH in comparison with controls, although the rhGH-treated subjects showed an higher percentage of heavily damaged nuclei immediately after the treatment (POST30 vs. PRE: *p*=0.003), with a lower mitogenic potential of lymphocytes, detectable up to the POST30 (PRE vs. POST: *p*=0.02; PRE vs. POST30: *p*=0.007).

Conclusions: This pilot study showed that 3 weeks of short-term supra-physiological rhGH administration in healthy women induce a transient DNA damage and mitogenic impairment in PBL. The analysis of DNA damage should be explored as useful tool in monitoring the mid to long-term effects of high rhGH treatment or abuse.