

handled better their irritability, their mood at home, and were less prone to episodes of extreme nervousness capable of provoking violent discussions. Several reports proposed hCG might be used for the treatment of psychoses or neurosis.^{29,61,24} Our study appears to corroborate these proposals.

To conclude, this study poses several still unanswered questions:

1. **hCG absorption.** We have tested all volunteers, screening for the p-hCG in plasma. Concentrations were undetectable in all cases.

Therefore, which hCG fraction is responsible for the pharmacological activity observed in our study? hCG's molecular size (alpha chain -14,500 KD; beta chain -22,200 KD) makes it highly improbable that the entire molecule has been absorbed. Our hypothesis is that only a fraction of the entire hCG molecule is absorbed through this administration route.

2. **hCG and lipid metabolism.** We do not know precisely how hCG acts on adipose tissue metabolism. However, some reports^{32,84,85,83} suggest hCG possesses a metabolic activity on adipose tissue (i.e. decrease lipogenesis). These actions are not directly exerted on adipocytes, since fat cell membranes have no receptors for hCG.³²

3. **hCG and mood.** A stable mood and lack of attrition characterized the hCG-treated group.

It is well known that VLCD's are associated with mood changes, particularly attrition⁷⁸ during the dieting period. In one study, disinhibition and hunger were significantly related to anxiety and depression while restraint was not.⁴⁴ Another study concluded that elevated levels of anxiety persist in female patients throughout a VLCD course of treatment.⁴⁵

Also many patients complain about fatigue during a VLCD.⁴

Conversely, our data suggest that hCG-treated volunteers rather improved their attitude towards their environment, in the sense of an enhanced well-being, less irritability and lack of fatigue. Since commercial preparations of hCG contains 3-endorphin³⁹ and this neuropeptide has been demonstrated to affect the function of limbic-emotional circuits,^{21,58,5,28} we hypothe-

sized that the p-endorphin fraction present in commercial preparations of hCG might account for the activity observed regarding mood control.

Additional studies remain to be performed to test the validity of this hypothesis.

Conclusions

1. Female obese volunteers participating in a double blind study, and submitted to the administration of an oral presentation of hCG plus a VLCD, decreased specific body circumferences and skin-fold thickness from conspicuous body areas more efficiently than Placebo+VLCD-treated subjects.

Since a significant fat proportion from total body fat is subcutaneously located (50 to 65 percent, depending on sex and fat distribution), this hCG metabolic activity would result in a reduction of the total body fat mass, the main cause for obesity. We suggested that the combination of a VLCD and oral hCG could not only trigger clinically significant changes in subcutaneous fat stores but simultaneously decrease body weight and modulate body contour.

2. hCG oral administration proved to be a safe and effective procedure on obese treated volunteers. No side effects were observed during the study. There are no reports in the literature regarding this administration route to compare our findings.
3. Compared to placebo treated subjects, volunteers managed with an oral administration of hCG coped more efficiently with daily irritating situations, were in a better mood, and handled home conflicts without stepping up family discussions.

This study appears to contradict former conclusions on the issue of hCG and obesity. We attribute those differences to a different approach, including variables not assessed in former publications.

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