

# Biotin - the forgotten vitamin in MS ?

## Screening of biotin-deficiency and low biotin ranges in newly diagnosed MS patients.

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### OBJECTIVE

In this study we tested the hypothesis, if decreased biotin levels were frequent at the onset of MS disease.

### BACKGROUND

Reported effects of high dose biotin in chronic MS (Tourbah, 2016) evoked the question, if lower biotin levels are frequent in MS.

Anagnostouli (1999) first reported lower biotin levels in CSF of MS patients.

It could be argued, that biotin deficiency is a risk factor for MS due to the fact, that biotin is an limiting coenzyme in fatty acid synthesis. For example biotin is an essential cofactor for propionic acid breakdown, and deficiencies may impair propionic acid and carnitine metabolism .

### METHODS

Blood serum can be tested easily to evaluate biotin deficiency. Levels above 200 ng/l are optimal, 100-200 ng/l suboptimal, those lower than 100 ng/l require substitution.

35 patients (average age 41.9, 25 female, 10 male) with diagnosed MS within the first year were checked for biotin levels. This we compared to an former study with biotin levels of 146 MS patients (107 female, 39 male, average age 49.44) and a control group with 82 patients.

### RESULTS

The 35 newly diagnosed MS patients had an average biotin level with 251 ng/l, median 219, compared to the entire MS group (142 patients), average biotin value 260.9 ng/l, median 222.5. In the control group the average value was 335 ng/l, median 278, with significant difference ( $p < 0.01$ ).

### CONCLUSIONS

These findings suggest a high probability of more frequent biotin deficiency especially in newly diagnosed MS patients. As a limiting coenzyme for myelin synthesis and mitochondrial function, biotin deficiency might be a relevant risk factor for newly diagnosed MS patients and possible key player for disease outcome. As biotin substitution is a safe, simple and inexpensive supplement to immunomodulatory therapies, routine biotin screening of newly diagnosed MS could be helpful to prove the therapeutic potential of biotin supplementation.

### REFERENCES

Tourbah et al.: Multiple sclerosis journal 2016 vol.22 (13) 1719-1731  
Anagnostouli M. et al.: Cerebrospinal fluid levels of biotin in various neurological disorders - Acta Neurol. Scand 1999.99.387-392  
Maier-Janson : Biotin-deficiency and suboptimal biotin ranges seem to be frequent in MS patients. - Multiple Sclerosis Journal 2017; 23: 39 - Maier-Janson, Roth, Scholz: Biotin deficiency and lower biotin ranges on MS-patients-where is the connection? - J Neurol Sciences 2017; 381 (Suppl.): 782

### ILLUSTRATION

#### Biotin-dependent carboxylases: overview

