

Influence of vitamin B₁₂ status and different dietary levels of folic acid on several immune parameters in aged rats

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Intake of folic acid (FA) in very high amounts leads to conditions similar to those of metabolic deficiency in folate⁽¹⁾. In a similar way, vitamin B₁₂ status influences the physiological response to different FA doses in the organism⁽²⁾. Several studies relate both the shortage of folate as well as its excess with a change in the immune response⁽³⁾. Similarly, it has been found that vitamin B₁₂ may play an important role in cellular immunity. Therefore, an imbalance between the status of vitamin B₁₂ and FA could exacerbate the immune response⁽⁴⁾.

The aim of this study was to evaluate the global effect of different levels of dietary FA and vitamin B₁₂ on several parameters of the immune response in aged rats.

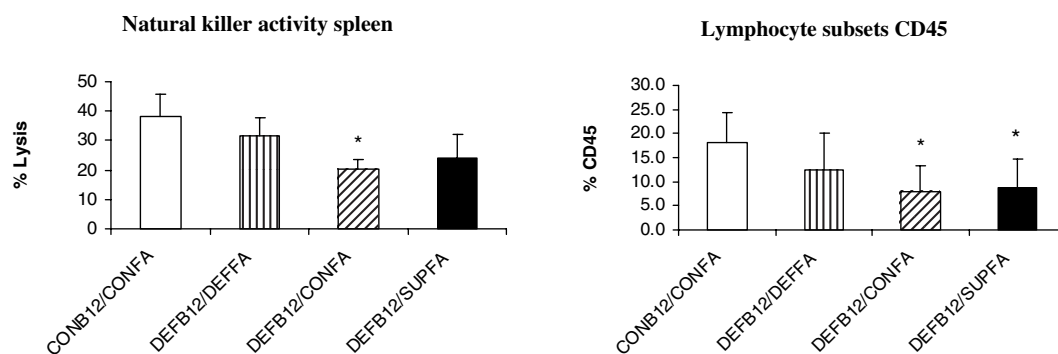
Twenty-month male Sprague–Dawley rats (*n* = 40) divided into four groups were fed during 30 days with differently supplemented diets:

- CON_{B12}/CON_{FA} (50 µg vitamin B₁₂; 2 mg FA)
- DEF_{B12}/DEF_{FA} (0 µg vitamin B₁₂; 0 mg FA)
- DEF_{B12}/CON_{FA} (0 µg vitamin B₁₂; 2 mg FA)
- DEF_{B12}/SUP_{FA} (0 µg vitamin B₁₂; 8 mg FA)

We evaluated the natural killer (NK) cytotoxicity in spleen, thymus and axillary nodes and lymphocyte subsets in peripheral blood.

There was a significant decrease in the NK cytotoxicity in the spleen, in the DEF_{B12}/CON_{FA} group (*P* < 0.05), but neither in the thymus nor the axillary nodes. Furthermore, we observed a significant decrease in the CD45 lymphocyte subsets in the groups DEF_{B12}/CON_{FA} and DEF_{B12}/SUP_{FA} (*P* < 0.05) but not in lymphocyte subsets CD4, CD8, CD3 and CD161.

An imbalance between B₁₂ and FA concentrations during ageing alters some immunological parameters such as the NK cytotoxicity and CD45 lymphocyte subsets. These effects have not been observed in a control (CON_{B12}/CON_{FA}) situation or even during deficiency of both vitamins (DEF_{B12}/DEF_{FA}). Therefore, the balance between the intake of folate and vitamin B₁₂ could be as important as their absolute concentrations in the diet.



1. Troen AM *et al.* (2006) *J Nutr* **136**, 189–194.
2. Morris MS *et al.* (2007) *Am J Clin Nutr* **85**, 193–200.
3. Field CJ *et al.* (2005) *J Nutr Biochem* **17**, 37–44.
4. Smith D (2007) *Am J Clin Nutr* **85**, 3–5.