Reduced Vitamin A RBP Levels in Hospitalized COVID-19 Patients

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Objectives: Vitamin A plays a key role in the regulation of the innate and acquired immune system. Vitamin A plays an important role in the fetal development of lung tissue and in the repair of infection-related damage. Reduced vitamin A levels have been described in the context of acute infections. In addition to an increased requirement, an increased excretion during inflammation is discussed. In this prospective, multicenter cohort study (University Hospital Münster, Hospital Steinfurt), vitamin A plasma levels were compared in critically to convalescent COVID-19 patients. For the first time, unbound free vitamin A, retinol-binding protein (RBP) and total vitamin A were differentiated.

Methods: The vitamin A levels of hospitalized COVID-19 patients with critical illness course ($n = 20$) were compared with COVID-19 patients with blood sampling in convalescence ($n = 20$). In addition to the determination of total vitamin A, the determination of unbound vitamin A and RBD was performed.

Results: In the critically ill COVID-19 patients in the acute phase of the disease, significantly lower levels of total vitamin A (total, $p < 0.01$) and RBD itself ($p < 0.01$) were detected compared to the patients with blood sampling in convalescence. In both groups, only a very small amount of unbound vitamin A was present.

Conclusions: During the acute phase of disease in COVID-19 patients, both total vitamin A and RBD-bound levels are significantly decreased. These results support previous data on vitamin A deficiency in the setting of acute infections. Further work is needed to investigate the impact on COVID-19 disease progression.

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