

Glucocorticoids are harmful in treating viral respiratory infections

Research 29 May 2020

Glucocorticoids are widely used in treating acute respiratory distress syndrome (ARDS) despite there being no indisputable scientific evidence of their effectiveness. The main reason seems to be that there is no effective treatment for ARDS patients on ventilators. The death rate of these patients differs between 30-40 percent depending on the data.

ARDS is often caused by a serious viral or bacterial infection. Type I interferons alpha and beta (IFNs) are signalling proteins produced by the human body and they are needed in fighting off viral infections. For this reason, IFNs have been used successfully in treating ARDS in early-phase clinical trials. However, in a recently published later-phase clinical trial (INTEREST), this effect was no longer observed. The trial was carried out as an international study covering 300 patients at different medical centres.

A closer analysis revealed that most patients who participated in the study had received glucocorticoids in addition to IFN beta, which proved to be exceedingly harmful. The death rate of patients who

were treated only with interferons was 10.6 percent, but the addition of glucocorticoids increased the death rate to 39.7 percent.

GLUCOCORTICOIDS INHIBIT INTERFERON SIGNALLING AND INCREASE MORTALITY

At the MediCity Research Laboratory of the University of Turku, Finland, the research groups of Academician, Professor Sirpa Jalkanen and Academy Research Fellow Maija Hollmén investigated what caused this abrupt increase in death rates.

The researchers demonstrated with cell and tissue cultures that glucocorticoids inhibit IFN signalling

and prevent both the body's own and administered interferon from fighting against the disease.

"This is probably the most important observation for saving human lives that I have made in my career. After we overcame the immense disappointment caused by the results of the INTEREST trial, we became sure that there had to be an explanation - and now we have found it", says Professor Sirpa Jalkanen.

The findings are extremely important especially during the current pandemic, as the COVID-19 disease incapacitates the body's IFN production. WHO has already forbidden the use of glucocorticoids in treating COVID-19.

REFERENCE

Juho Jalkanen, Ville Pettilä, Teppo Huttunen, Maija Hollmén, Sirpa Jalkanen. Glucocorticoids inhibit type I IFN beta signaling and the upregulation of CD73 in human lung. *Intensive Care Med*, 2020. doi: 10.1007/s00134-020-06086-3.