INTERNATIONAL SYMPOSIUM ON INFECTIOUS DISEASES AND VACCINES

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Covid-19 And the Mineralocorticoid Receptor; Key to Understanding an Effective Therapy

Abstract: Covid-19 has killed millions of people around the world. Vaccines have made a major impact but new virus variants continue to emerge and many people are either not vaccinated or under-vaccinated. It thus remains a major health problem. Our research has focused on understanding the pathogenesis of COVID and using this to introduce a highly effective treatment. COVID-19 binds to the ACE receptor and uses this to enter the cell. The loss of this receptor results in a failure of conversion of angiotensin-II (A-II) to angiotensin (1-7). High levels of A-II stimulate NADPH-oxidase with consequent elevated Reactive Oxygen Species (ROS) levels. The Mineralocorticoid Receptor (MR) is normally specific for aldosterone and is protected from cortisol by 11b-HSD2 which converts cortisol to cortisone. This inactivation is lost with high ROS levels which results in cortisol activating the MR. In epithelial cells such as in the kidney activation of the MR stimulates ATP exocytosis, activation of purinergic receptors, calcium entry, contraction of the cell and opening of the sodium channel. In endothelial cells it results in exocytosis of Weibel Palade bodies containing the Von Willebrand Factor (VWF) (comes out like a spider's web, attracts platelets and hence clotting) and angiopoietin II which massively increases capillary leak. Severe COVID is associated with high levels of VWF and angiopoietin II. MR blockade inhibits their release. We have used a combination of spironolactone to block MR and dexamethasone to inhibit cortisol to treat COVID (SpiroDex). In two major trials of inpatients admitted with COVID we have shown that Spirodex is significantly better than dexamethasone alone. The discovery that 59% hospital patients with COVID had undetectable levels of aldosterone confirms the hypothesis.

Biography: Professor Christopher Edwards is an endocrinologist with a special interest in corticosteroids. He served as a Professor of Clinical Medicine at Edinburgh University from 1980 to 1995, where he was also Dean of Medicine from 1991 to 1995. In 1995, he became the Principal of Imperial College School of Medicine, holding this role until 2000. Following that, he was appointed Vice-Chancellor of Newcastle University, a position he held from 2000 to 2007. Professor Edwards then chaired Chelsea and Westminster Hospital from 2008 to 2014 and also chaired Medical Education England from 2008 to 2012. Additionally, he served as Chairman of the Council of the British Heart Foundation from 2010 to 2015. He has contributed significantly to clinical research, holding the position of Senior Clinical Research Fellow at Imperial College. With over 500 publications, he has made substantial contributions to medical science and healthcare leadership.

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