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Plenary lecture

ENDOCRINOLOGY OF CRITICAL ILLNESS

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Striking alterations within the hypothalamic anterior-pituitary axes characterize critical illness and the severity of these hormonal imbalances is associated with the risk of morbidity and mortality. Most attempts to treat some of these endocrine abnormalities however have shown to be ineffective or even harmful. The pathophysiological insight of a biphasic (neuro) endocrine response to critical illness has helped to clarify this controversy.

The acute phase is characterized by an actively secreting pituitary, whereas the concentrations of most peripheral hormones are low, partly due to the development of target-organ resistance or to altered peripheral metabolism and binding of the target organ hormones. In contrast, in prolonged critical illness, a uniform suppression of the (neuro) endocrine axes, predominantly of hypothalamic origin, contributes to the low serum levels of the respective target-organ hormones. The adaptations in the acute phase are considered to be beneficial for short-term survival. However, in the chronic phase of intensive-care dependent critical illness, the observed neuroendocrine alterations may contribute to the wasting syndrome of the critically ill and hereby hamper recovery and rehabilitation. With the exception of intensive insulin therapy, and perhaps hydrocortisone administration for a subgroup of patients with septic shock, no hormonal intervention so far has proven to beneficially affect survival. However, the combined administration of hypothalamic releasing factors holds promise as a safe therapy to reverse the neuroendocrine and metabolic abnormalities of prolonged critical illness by a balanced re-activation of the different anterior-pituitary axes. An updated overview of the published work on this topic and some novel unpublished data will be presented.