



Serum Cortisol Test for Serious Dengue Infected Patient

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INTRODUCTION

Dengue infection presents a wide range of clinical symptoms. Serum cortisol is known as a severity predictor of serious infection but is not yet clearly understood in dengue infection. We aimed to investigate the pattern of cortisol response after dengue infection and evaluate the possibility of using serum cortisol as the biomarker to predict the severity of dengue infection. The serum cortisol at day of admission was likely to be associated with dengue severity. Further studies may focus on the possibility of using serum cortisol as one of the biomarkers for dengue severity. Dengue is a mosquito-borne viral disease that has spread to many regions of the world, particularly in Asian, African and Latin American countries, where it is endemic. Dengue infection is one of the leading causes of serious illness and death among children and adults in these regions. In 2019, 5.2 million dengue cases were reported to the WHO (World Health Organization), with reported deaths increasing from the previous decade.

DESCRIPTION

While many dengue infections produce only mild illness, it can cause a more serious acute flu-like illness. This can develop into severe infection with potentially fatal complications such as plasma leakage, fluid accumulation, respiratory distress, severe bleeding, or multi-organ impairment. Recently, the WHO determined warning signs to predict severe dengue infection, such as severe abdominal pain, persistent vomiting, rapid breathing, bleeding gums/nose, liver enlargement, restlessness and blood in vomit/stool. Patients with warning signs may not necessarily develop severe dengue, while those without warning signs remain susceptible to developing a severe dengue infection. A previous study among the adult cohort found that no single warning sign alone or combined had a sensitivity to predict severe dengue of more than 65%.

The mechanisms and physiologic changes, especially in the endocrine system, which increase the risk of developing a severe den-

gue infection, are poorly understood. The kinetics of endocrine changes has been widely studied in several critical illnesses, such as septic and cardiogenic shock, but have rarely been studied in dengue infection. Previous studies, in 1995, demonstrated that the highest mean serum cortisol level was found in the febrile stage of children with both dengue hemorrhagic fever (DHF) and dengue fever (DF). However, the mean cortisol level in DHF was higher than in DF. The serum cortisol levels subsequently decreased by half during the convalescent phase. Another study revealed that serum cortisol levels tended to be insufficient during the course of dengue infection, both during the febrile stage in children with DF and the shock stage in persons with DHF. In 2019, a study of adults showed that patients with DHF had slightly higher median cortisol concentrations than patients with DF in febrile phase, but not on the day of defervescence or later.

To the best of our knowledge, there have been no substantial studies that demonstrated the changes in serum cortisol levels over time in individuals infected with dengue virus. Early cortisol response may predict the severity of dengue infection, which could potentially serve as one of the biomarkers for severe dengue disease. To address this knowledge gap, this study aimed to investigate the pattern of cortisol response at different time points in patients with severe and non-severe dengue infections, and evaluate the possibility of using cortisol levels at the day of hospital admission as a clinical biomarker to predict dengue severity.

CONCLUSION

During sepsis, the surging of serum cortisol levels reflects the adaptive hormonal response of the hypothalamic-pituitary-adrenal (HPA) axis, which is important for catecholamine effects and vasopressin release. Cortisol itself also has an important role in maintaining the vascular response to catecholamines, leading to the maintenance of an adequate blood perfusion pressure in vital organs.

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