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Editorial

CIRCI – What should the clinician do?

The activation of hypothalamic pituitary-adrenal (HPA) axis is an integral part of body's adaptive response to stress and critical illnesses. It is well-known that in catecholamine refractory shock replacement with corticosteroids is one of the standard lines of management and helps in correction of shock as well as optimization and improved response to vasoactive drugs [1]. Though adrenal failure may be encountered in critically ill patients who may not be shock; its clinical relevance and therapeutic importance is controversial. The authors of the study "Critical illness related corticosteroid insufficiency (CIRCI) in children - A single center, prospective, cohort study" published in this issue of IJCH have made a good effort to find out CIRCI incidence in pediatric patients [2].

The authors found that about 38% patients had CIRCI and concluded that the CIRCI was not an independent risk factor for mortality; however, this is in contrast to certain adult studies [3]. This brings us to the point of, what should be the clinical relevance of this; and whether these patients if not in shock, would benefit or not from corticosteroid supplementation. Additional information or further studies should probe into this matter. CIRCI was highest among patients with septic shock and is not a surprising observation. There was also an unusually high mortality in septic shock subgroup. We do not know whether they all received an early goal directed therapy and how many of them received corticosteroids. A sub-group analysis for shock and non-shock patients separately; would have been highlighted the impact of CIRCI on non-shock patients more clearly.

The authors also concluded that there was a significantly higher requirement of vasoactive drugs and fluid boluses in the CIRCI group. We would disagree with them based on the following factors. First, they have considered only the fluids given after PICU admission and most of these patients would have been resuscitated in the emergency room. Hence, the actual amount of boluses that was given is different from what is quoted. Second, there was no fixed protocol for giving vasoactive drugs. Hence, directly concluding that CIRCI leads to higher requirement of these agents would be little redundant. Based on available literature, we would agree that CIRCI patients require higher support and are more likely to have catecholamine refractory shock; but a refractory shock is a different entity and "higher number" of vasoactive drugs is different. We also do not know whether these drugs were used in maximal doses or not. Mean doses of individual vasoactive drugs would have added more meaning to the results but could not be done due to logistic reasons. A very interesting and relevant fact that has been observed by the authors is the higher levels of baseline cortisol in patients with CIRCI as compared to controls. Other studies have also shown this and in fact, the mortality is shown to be higher in these patients [4].

This is a wonderful study and has added relevant information on CIRCI in the Indian context. Researchers in critical care should take this forward, and we should try and find out the therapeutic implications of this. Only septic shock and early acute respiratory distress syndrome have been proven to benefit from corticosteroid supplementation. We do not have any evidence in other disease conditions at present, and screening for such patients would be worthwhile only if a therapeutic benefit can be established. Hence, another research question would be the selection of the patients, i.e. all critically ill patients should be screened or should we have some criteria to identify at risk patients?

There are limitations to diagnosis of CIRCI that need to be also thought of. Free cortisol levels (rather than total cortisol levels) have more clinical significance, but due to technical difficulties are not done routinely. Adrenocorticotropic hormone (ACTH) stimulation test also has its disadvantages. It is poorly reproducible and does not truly reflect the endogenous integrity of the HPA axis. The delta cortisol values proposed in guidelines also need to be critically reviewed because they are highly dependent on basal cortisol levels. The same has been observed in this study. Low dose of 1 mcg ACTH may be more physiologic and relevant [5]; but is still not recommended. In addition to these limitations, we do not know whether a laboratory deficiency of cortisol truly reflects a cellular deficiency and vice versa [6]. We still need to ponder the big question – "What should the clinician do?"

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