Letter to the Editor

The Potential Role of Bromelain in the Treatment of SARS-COV-2

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Dear Editor

The biggest challenge of last year worldwide has undoubtedly been to deal with the outbreak of the novel coronavirus (SARS -COV-2), which was spread from Wuhan, China to other parts of the world at the end of last year (2019).

SARS-COV-2 uses the ACE2 receptor to enter human cells and involve these receptors (1). ACE2 is capable of cleaving, des-Arg bradykinin which is involved locally in vessel dilation through binding to the B1 receptor (2). Des-Arg-BK is the only active metabolite of BK (3). It should be noted that activation of the B1 receptor in lung endothelial cells causes severe deterioration and increased mortality in many diseases; on the other hand, this receptor on endothelial cells is upregulated by proinflammatory cytokines (4).

Followed local lung angioedema could chip into the disease by an increase of local immune cell influx and proinflammatory cytokines leading to increasing severity (5). This inflammation persuades more B1 expression, and possibly via antibody-dependent increase of viral infection leading to continued ACE2 dysfunction in the lung because of the durability of the virus (6). In this standpoint bradykinin-dependent, local lung angioedema via B1 and B2 receptors is a significant trait of SARS-COV-2 (7). Hence it seems that blocking the B1 and B2 receptors might have an ameliorating effect on disease caused by COVID-19.

Bradykinin is a pro-inflammatory molecule (8). Bradykinin B1 and B2 receptors are constitutively expressed in the airways on several residential and/or immune cells (9). Their expression can also be induced by inflammatory mediators, usually associated with eosinophil and neutrophil recruitment, such as IL-4, IL-13, TNF-α, IL-6, and IL-8, via intracellular MAPK and NF-κB signaling (10). BK exerts its pharmacological effects, mainly vasodilation, by activating constitutively expressed B2 receptors (11). BK is metabolized by three metallopeptidases (5). Whereas, the angiotensin-converting enzyme (ACE) constitutes the main degradation pathway that transforms BK into its final inactive metabolite BK.

Bromelain is an anti-inflammatory that plays a role in reducing serum and tissue levels of kininogen and bradykinin (12). This substance is obtained from raw pineapple extract and if orally administered, while retaining its properties, it is reabsorbed through the intestines (13). Numerous therapeutic properties of this substance are known for many diseases including bronchitis, sinusitis, arthritis, and inflammation. The positive effects on the mentioned diseases can be

attributed to the anti-edema, anti-inflammatory, and coagulation-inhibiting properties of bromelain (14). These effects are due to an enhancement of the serum fibrinolytic activity and inhibition of the fibrinogen synthesis, as well as a direct degradation of fibrin and fibrinogen (13). As mentioned, bromelain has anti-inflammatory properties. On the other hand, this drug potentially activates the immune system in association with the rapid response to cellular stress (15). Conversely, bromelain reduces cytokine secretion when immune cells are already stimulated in the condition of inflammation-induced overproduction of cytokines.

Thus, by carefully studying the pathogenesis and clinical signs of patients with SARS -COV-2, the use of Bromelain can have a positive effect on the treatment process of these patients. However, to determine the type of treatment, the amount of administration, the duration of action of the drug and to determine the possible adverse effects, the implementation of a clinical process can play an effective role.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

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