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## Diabetes &amp; Metabolic Syndrome: Clinical Research &amp; Reviews

journal homepage: [www.elsevier.com/locate/dsx](http://www.elsevier.com/locate/dsx)

Letter to the Editor

## Diabetes, D-dimer and COVID-19: The possible role of glucose control

**Keywords:**

Hyperglycemia  
 COVID-19  
 Thrombosis  
 Cardiovascular disease  
 Diabetes

Diabetes is accompanied by a thrombosis-prone status [1,2]. Available evidence shows that an activation of the thrombosis may be generated by hyperglycemia [1,2]. A pro-thrombotic status may be induced by hyperglycemia through two different pathways: oxidative stress and non-enzymatic glycation [1,2]. Acute hyperglycemia, through oxidative stress, increases thrombin generation [3], while the non-enzymatic glycation reduces the functionality of both antithrombin III and heparin co-factor II [4,5]. In conclusion, evidence shows that hyperglycemia may produce a pro-thrombotic status, due to an imbalance between pro-coagulation, anti-coagulation and fibrinolysis [1,2,6].

Mishra et al. have recently reported in the case of COVID-19 an increase of D-dimer in people with diabetes compared to people without diabetes [7]. Evidence is showing that high blood glucose can condition the prognosis of COVID-19 [8,9]. Interestingly, in people with hyperglycemia and COVID-19 increased D-dimer levels have been found [8,9]. Moreover, it has been shown that reducing hyperglycemia is followed by a decrease of the D-dimer [9]. This evidence suggests that hyperglycemia might favor the generation of the thrombosis, a complication very often is present in the COVID-19 [10,11].

If confirmed in specific well-designed studies, this hypothesis may pay the way to possible useful interventions. A fast reduction of hyperglycemia, for its important implications on coagulation activation [1,2], might be very important, while non-enzymatic glycation is, at the beginning, a reversible phenomenon [12]. Furthermore, a fast use of heparin may also be very relevant and not only for its obvious anticoagulant property: heparin can spare antithrombin III and heparin co-factor II from being glycosylated [4,5].

In conclusion, because thrombosis affects the prognosis of people with COVID-19 [13], understanding what contributes to increase the risk for a thrombotic event in this disease is highly relevant. Therefore, clarifying the possible link between hyperglycemia and thrombosis with specific studies might be very useful for a better management of COVID-19.

**Funding**

None.

AC wrote, revised and approved the final version of the manuscript.

**Declaration of competing interest**

Antonio Ceriello does not have conflicts of interest to declare.

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11 October 2020