

Is glucose-6-phosphatase dehydrogenase deficiency associated with severe outcomes in hospitalized COVID-19 patients?

Introduction: Glucose-6-phosphate dehydrogenase deficiency (G6PDd) is known to suppress the antioxidant system and is likely to aggravate severity of COVID-19, which results in a pro-oxidant response. This possible association has not been explored adequately in human studies.

Methods: We enrolled a random sample of 1792 patients who were hospitalized with COVID-19 between February and July 2020 in Bahrain, using electronic medical records, and studied the occurrence of severe outcomes in patients with and without G6PDd. Primary outcome was defined as any of the following: requirement of non-invasive ventilation, intubation or death. The odds of developing primary outcome were estimated using multivariable logistic regression models.

Results: Of the 1792 study participants, 175 had G6PDd (9.76%). Compared to non-G6PDd participants, G6PDd patients were predominantly Bahraini nationals (91.4% vs. 52.9%), had higher prevalence of Sickle Cell Disease (9.7% vs. 1.3%), Hypertension (36.6% vs. 29%), Asthma (7.4% vs. 4.1%), Chronic Kidney Disease (9.7% vs. 3.8%), and had fewer symptoms (59.4% vs. 63.9%). Occurrence of primary outcome was lower in G6PDd patients compared to their non-G6PDd counterparts (4.6 vs. 6.4%, $p=0.33$), and the odds of developing the outcome in G6PDd group (Table 1) were also slightly lower, although not significantly, after adjusting for age, nationality, comorbidities and drug interventions (OR: 0.40, 95% CI: 0.142, 1.148).

Conclusion: We did not find an association between presence of G6PDd and occurrence of serious outcomes in hospitalized COVID-19 patients. Further investigation that extends to both,

hospitalized and non-hospitalized COVID-19 patients, is required to study this potential association.

Table 1 Odds of suffering the primary outcome in patients with G6PDd compared to non-G6PDd patients.

Type of analysis	OR (95% CI)	P value
Crude	0.69 (0.33, 1.45)	0.337
Adjusted for age, nationality, drug interventions, comorbidities (HTN, COPD, CKD, SCD)	0.403 (0.142, 1.148)	0.089

Abbreviations: HTN: Hypertension, COPD: Chronic Obstructive Pulmonary Disease, CKD:

Chronic Kidney Disease, SCD: Sickle Cell Disease