

## The effect of sever glucose-6-phosphate dehydrogenase(G6PD) deficiency on the activity of white blood cells for a female medical students in Basrah University.

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### **ABSTRACT :**

This study involved ( 57) female medical student, aged between ( 19-24) years, subdivided into two groups, control group that consist of (30) female with normal level of G6PD enzyme and case group that consist of (27) female with severe G6PD deficiency. Both groups have hemoglobin type AA, and white blood cells were estimated for them. We tried in this study to identify the effect of sever G6PD deficiency on the phagocytic activity of non isolated granulocytes from the whole blood, to mirror the in vivo stimulation of granulocytes and the effect of severe G6PD deficiency on their phagocytic activity. We demonstrate a statistically significant proportion (  $P < 0.05$ ) between the granulocytes phagocytic activity and severe G6PD deficiency. This could form the basis for drug development in order to prevent or treat G6PD deficiency-related disease and thus unburden the public health system.

**Key Words:** G6PD, granulocyte, Phagocytosis.

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### **INTRODUCTION:**

Glucose-6-phosphate dehydrogenase deficiency, is an x-linked recessive hereditary disease, characterized by abnormally low levels of glucose-6-phosphate dehydrogenase ( G6PD)<sup>1</sup>, a metabolic enzyme involved in the pentose phosphate pathway, especially important in red blood cell metabolism<sup>2</sup>. Individuals with the disease may exhibit non immune hemolytic anemia in response to a number of causes, most commonly, consumption of broad beans, exposure to certain medications or chemicals and infections<sup>3</sup>. Possible mechanisms for the sever deficiency of G6PD in erythrocytes and polymorphonuclear leucocytes(granulocytes), were investigated<sup>4</sup>. The granulocytes exhibit

Phagocytosis, which is an essential function of immune system<sup>5</sup>. Actively phagocytizing granulocytes emit light or chemiluminescence's ( CL) which has been shown to be linked to the oxidative activity of the phagocytizing polymorphonuclear leucocytes<sup>6</sup>. The production of reactive oxygen metabolites by granulocytes plays a key role in a host defense against invading microorganisms and foreign bodies<sup>7</sup>. The ability of granulocytes to kill bacterial organisms by a process of Phagocytosis respiratory burst is related, in part, to their capacity to generate several reactive oxygen species(ROS)<sup>8</sup>. These (ROS) include [ super oxide, nitric oxide, hydrogen peroxide, hydroxyl radical and singlet oxygen]<sup>9</sup>.The term respiratory burst