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EVALUATION OF TETRAHYDROBIOPTERIN (BH4), DIHYDROPTERIDINE REDUCTASE (DHPR), PHENYLALANINE HYDROXYLASE (PAH) AND MATRIX METALLOPROTEINASE-17 (MMP17) IN HYPERTENSIVE STROKE PATIENTS IN BASRAH

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ABSTRACT : Stroke is acute cerebrovascular injury, including ischemic and hemorrhagic strokes. It is an extremely debilitating and lethal disease that poses a significant threat to human health due to its high occurrence and poor prognosis. A variety of the biochemical factors may alter during or after the occurrence of a stroke, some of them may change before the incidence of stroke and may be considered as a major causes of it or they represent risk factors for stroke occurrence. Knowing of these changes represent a major goal for specialists in finding the appropriate therapies for treating strokes or to prevent it from occurring, or at least reduce the risk of stroke. Our study aimed to evaluate BH4, DHPR, PAH and MMP17 in hypertensive stroke patients in Basrah- Iraq, in order to know whether they represent biomarkers of ischemic stroke.The study included 50 patients with stroke (28 males and 22 females) aged between 44 to 67 years, which was admitted to Al-Sader Educational Hospital in Al-Basrah Government of Iraq, for the period extended between December 2019 to March 2020. A control group of 50 entirely healthy participants, with no chronic illnesses, no history of stroke, heart failure, or inflammation or infection in the previous two weeks and an age range of 46-65 years was chosen at random as 25 men and 25 women. The results of the study showed a significant increase in each of BH4 concentration and the activity of MMP17 in the stroke patients comparing to the control. From the results, we concluded that BH4 elevated significantly in patients with a moderate or severe ischemic stroke. This source of this elevation was not known. In the other hand MMP-17 showed a significant elevation in its activity only in the patients with a sever ischemic stroke.

Key words : Stroke, tetrahydrobiopterin, dihydropteridine reductase, phenylalanine hydroxylase, matrix Metalloproteinase-17.

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INTRODUCTION

Stroke is acute cerebrovascular injury, including ischemic and hemorrhagic strokes. It is an extremely debilitating and lethal disease that poses a significant threat to human health due to its high occurrence and poor prognosis (Chen, 2017). After ischemic heart disease, it is the world's second leading cause of death and disability (Krishnamurthi, 2020). In the United States, it is the third most leading cause of mortality (Lopez, 2006; Lloyd-Jones, 2010). Despite improved care options and prevention services, stroke prevalence, occurrence, and mortality rates rose between 2010 and 2017 (Goldstein, 2020). According to the Global Burden of Disease report's most recent findings, beginning at the age of 25, a person's lifetime risk of suffering a stroke is around 25% (Feigin, 2018). When confronted with the complexities of a worldwide cerebrovascular disease crisis, there's a need for biomarkers to aid in the care of stroke patients on an individual basis in the precision medicine's context is becoming more evident (Hinman, 2017; Simpkins, 2019). This is valid not only for assessing individual risk for cerebrovascular disorders in order to develop initial preventative actions, but also for post-incident secondary prevention has occurred. Stroke is a complicated disease with multiple underlying risk factors and etiologies, and recent literature indicates that the safest treatment is to focus on the underlying risk factors and etiologies. These circumstances require a thorough,