Prognostic Value of SCUBE-1 in Ischemic Stroke

SCUBE-1 in İskemik İnmede Prognostik Değeri

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Dear editor

SCUBE-1 is a newly identified cell surface protein identified during early embryogenesis. SCUBE-1 is known to be involved in the angiogenesis mechanism. SCUBE-1 was first detected in human umbilical vein endothelial cells, so it was said that it originates and is secreted from the vascular endothelium. It is also found in organs and tissues with high vascularization such as kidney, brain, lung, spleen and liver (1).

In addition to embryonic expression, SCUBE-1 is also known to be expressed from endothelium and platelets. In recent studies, it has been shown that it is also secreted from platelets and is a platelet-derived protein. SCUBE-1 is stored in alpha granules of inactive platelets. When platelets are activated by thrombin, SCUBE-1 expression is enhanced and they are secreted as small, soluble particles from the platelet surface (2). It plays a role in platelet agglunitation and activation. It has been shown in the literature that SCUBE-1 levels increase in oxidative stress conditions such as ischemic events, mesenteric ischemia, testicular torsion, pulmonary embolism, cancer diseases, cardiopulmonary arrest and acute coronary syndrome (3).

Stroke was defined by the World Health Organization in 1988 as a focal or global impairment of cerebral function lasting longer than 24 hours or until death without an obvious non-vascular cause. This historically important definition is a general description that includes all stroke types (4). The definition was updated by the American Heart Association in 2013 as a period of neurological dysfunction due to focal cerebral, spinal, or retinal infarction. ischemic stroke; In the "Global Burden of Disease Study 2019" published in 2021, it is still the second most common cause of death in the world and the third most common cause of combined death and disability (5). In our country, the incidence of stroke has been reported as 177 per 100,000 and its prevalence as 254 per 100,000. It is estimated that about 132,000 people have a stroke each year (6).

It has been suggested in the literature that SCUBE-1 can be used as a biomarker in ischemic stroke in which the thromboembolic process plays a key role (7-9). In the first study, Dai et al. compared the SCUBE-1 level of 40 ischemic stroke patients with 40 healthy volunteers, and reported an increased SCUBE-1 level in ischemic stroke (7). Türkmen et al. reported that SCUBE-1 could be used as a biomarker in ischemic stroke in their experimental study with 24 female Sprague Dawley rats (8). Bolayır et al. showed that SCUBE-1 could predict ischemic brain volume in 35 ischemic stroke and 35 control patients and that SCUBE-1 could be a prognostic biomarker in ischemic stroke (9).

In conclusion, SCUBE-1 is promising as a biomarker in ischemic stroke. However, due to the single-center nature of the studies in the literature and their small sample size, their evidence value is low. Researchers should be encouraged to investigate the prognostic value of SCUBE-1 in ischemic stroke.

REFERENCES

1. Sonmez E, Turkdogan KA, Karabacak M, Civelek C, Yilmaz C, Ozer OF, et al. The diagnostic role of signal peptide-C1r/C1s, Uegf, and Bmp1-epidermal growth factor domain-containing protein 1 in non-ST-elevation acute coronary syndrome. Am J Emerg Med. 2015 Jan;33(1):21-4.
2. Özkan A, Sönmez E, Özdemir S, Özer ÖF, Muharrem N, Gülen B, et al. The Diagnostic Value of SCUBE1 in Unstable Angina Pectoris Patients. Eurasian J Emerg Med. 2016;15:167-171.
3. Yılmaz C, Gülen B, Sönmez E, Akbay D, Söğüt Ö, Özdemir S, et al. Serum SCUBE-1 Levels and Return of Spontaneous Circulation Following Cardiopulmonary Resuscitation in Adult Patients. Avicenna J Med. 2022 Sep 5;12(3):148-153.
4. Özdemir S, Cimilli Öztürk T, Ecmel Onur Ö. Relationship between the national institutes health stroke scale score and bispectral index in patients with acute ischemic stroke. J Exp Clin Med. 2021; 38(4): 440-4.
5. Santomauro DF, Melen S, Mitchison D, Vos T, Whiteford H, Ferrari AJ. The hidden burden of eating disorders: an extension of estimates from the Global Burden of Disease Study 2019. Lancet Psychiatry. 2021 Apr;8(4):320-328.
6. Yigit M, Sogut O, Yigit E, Turkdogan KA, Kaplan O, Dur A, et al. The relationship between anemia and recurrence of ischemic stroke in patients with Trousseau's syndrome: A retrospective cross-sectional study. Turk J Emerg Med. 2016 May 9;16(2):65-68.
7. Dai DF, Thajeb P, Tu CF, Chiang FT, Chen CH, Yang RB, et al. Plasma concentration of SCUBE1, a novel platelet protein, is elevated in patients with acute coronary syndrome and ischemic stroke. J Am Coll Cardiol. 2008 Jun 3;51(22):2173-80.
8. Turkmen S, Eryigit U, Karaca Y, Mentese A, Sumer UA, Yulug E, et al. Diagnostic value of plasma signal peptide-Cub-Egf domain-containing protein-1 (SCUBE-1) in an experimental model of acute ischemic stroke. Am J Emerg Med. 2015 Feb;33(2):262-5.
9. Bolayır A, Gökçe ŞF, Çiğdem B, Bolayır HA, Gülünay A, Çelik VK, et al. Can SCUBE1 be used to predict the early diagnosis, lesion volume and prognosis of acute ischemic stroke? Turk J Biochem. 2018;44:16-24.