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Defining a Clopidogrel Response Cut-off Value Using Light Transmission Aggregometry Prior to Pipeline Embolization of Unruptured Intracranial Aneurysms

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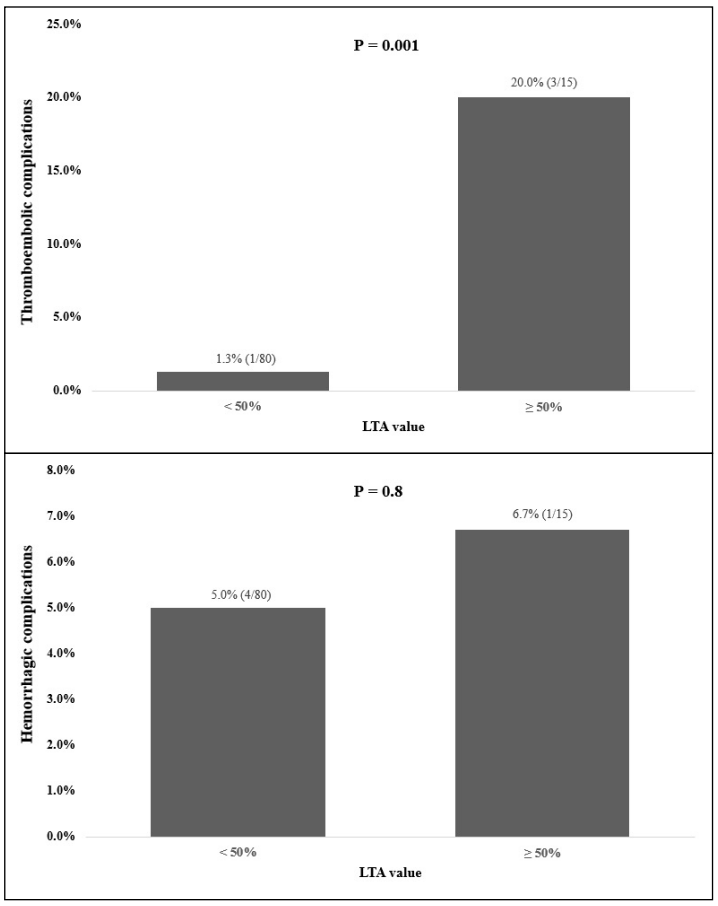
Introduction

Dual antiplatelet therapy is the current standard of care to mitigate the risk of thromboembolic complications following intracranial aneurysm Pipeline Embolization Device (PED) placement. The choice of appropriate antiplatelet therapy is usually guided by platelet function testing such as light transmission aggregometry (LTA). In this study, we aimed to define the optimal threshold LTA value for clopidogrel responsiveness.

Methods

A prospectively maintained database at an academic neurosurgical center in the United States was retrospectively analyzed from 2014 to 2017 to identify patients with unruptured intracranial aneurysms treated with the PED. Clinical and radiographic data were analyzed with an emphasis on identifying thromboembolic complications in the context of platelet function testing performed by LTA.



Results

A total of 95 procedures (median age: 61 years) were performed for PED placement to treat 110 unruptured intracranial aneurysms. Thromboembolic complications were encountered in 4 (4.2%) of these patients. After stratifying the complication rate based on the maximal extent of platelet aggregation following administration of an exogenous platelet agonist, a marked increase in thromboembolic events was observed in patients with LTA values greater than 50%. When LTA was dichotomized based on this value, patients with an LTA value less than 50% had a thromboembolic complication rate of 1.3%, compared to 20% for those with LTA values over 50%.

Conclusions

Currently, there is no accepted standard cutoff LTA value for determining the clopidogrel response in neuroendovascular procedures. We observed the greatest increase in the rate of thromboembolic complications with LTA values of over 50%.