FICOLIN 2: Study of a new predictive marker of atherosclerotic plaque vulnerability

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Objective:

The objective of this study is to unveil Ficolin-2 as a new predictive marker for the instability of carotid atherosclerotic plaques. We explored the circulating levels of ficolin-2 in a prospective cohort of 70 patients selected for planned carotid endarterectomy (CEA). Our data support that increased circulating levels of Ficolin-2, a recognition molecule of the lectin pathway (LP), indicate vulnerable plaques prone to rupture. Our central hypothesis is that the lectin pathway actively participates in the erosion of atherosclerotic plaque.

Methods:

We examined 70 Patients. Patients (n=30) were recruited at the IRCCS Mondino Foundation, Patients (n=40) were recruited at the San Martino Hospital.
Blood samples were obtained 24 hours prior to CEA. Plaque samples were frozen after surgery and processed. All carotid plaques were examined to identify the site of maximum plaque thickness and then dissected into two segments along the longitudinal axis on dry ice. Histological analysis was performed using the hematoxylin and eosin (H&E). The H&E stained sections were captured at 10X magnification using an Olympus BX61 virtual stage microscope. Immunofluorescence staining for ficolin-2 was performed.
Blood and plaque samples were collected and processed to assess levels of ficolin-2 via ELISA. Western blot analysis was performed on the plaques. We applied a histological vulnerability score, based on hemorrhagic content, lipid core area, infiltrated content, to quantify plaque morphology. The total score ranged from 4 to 16, identifying atheromas with a score higher than 12 as vulnerable plaques. Measuring circulating levels of lectin pathway initiators, one day before CEA, we observed that only elevated levels of ficolin-2 could be associated with plaque vulnerability.
Statistical analysis was performed using the Mann-Whitney test, unpaired t-test. Normal distribution was assessed using the Kolmogorov-Smirnov test, while correlations were analyzed using Pearson's r or Spearman's r. All tests were two-tailed, with p-values less than 0.05 considered statistically significant.

Results:

The results obtained in this study indicate that, in patients with a vulnerable plaque, circulating levels of ficolin-2 increase, indicating a chronic inflammatory process that could lead to a major adverse cardiovascular event.

Conclusion:

It emerges that elevated levels of ficolin-2 could be independent predictive markers of future adverse cardiovascular events. Ficolin-2 may be a plaque-specific morphological biomarker effective for secondary prevention.