Clinical and cytological correlation in the vulnerable carotid plaque: monocentric experience

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Disclosure

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I have the following potential conflicts of interest to report:

☐ Consulting
☐ Employment in industry
☐ Stockholder of a healthcare company
☐ Owner of a healthcare company
☐ Other(s)

☒ I do not have any potential conflict of interest
Innate immunity is implicated in all stages of atherosclerosis
Natural Killer (NK) cells detected in atherosclerotic plaques are involved in the pathogenesis of atherosclerosis
Two main subsets of NK
- \( \text{CD56}^{\text{dim}} \text{CD16}^+ \)
- \( \text{CD56}^{\text{bright}} \text{CD16}^- \)

NKG2D is a potent activating receptor expressed on NK cells surface
Recognizes at least 6 ligands (MICA - MICB - ULBPs)
Correlation between expression of NKG2D in the plaque and detectable levels of soluble ligands
Interaction ligands – NKG2D stimulates production of cytokines (IFN – \( \gamma \))
IFN – \( \gamma \) → MMPs → shedding of NKG2D ligands
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**Vulnerable Plaque**

- Proinflammatory cytokines release and activate MMPs
- Reduction of the fibrous cap thickness
- Endothelial denudation
- Ulceration
- Intraplaque bleeding
- Increased thrombogenicity of plaque components
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**Study**

- Identify predictive markers of vulnerable plaque
- Investigate how the clinical features of the patients were related to cytological expression within carotid plaque
- Blood samples from 50 patients undergoing elective CEA (31 symptomatic and 19 asymptomatic) and healthy donors
  - Flow – cytometry: NK subset distribution in plaque and blood
  - ELISA: evaluation of soluble ligands in sera
- NKG2D ligands and their soluble form were assessed and compared between both groups
Flow cytometric analysis confirmed the presence of NK cells and revealed that CD56$^{\text{bright}}$ NK cells are the dominant subset within carotid plaques and are accumulated in symptomatic patients.

In addition, symptomatic patients displayed higher levels of NKG2D soluble ligands.

\[ p<0.01 \]

\[ p<0.05 \]

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**Results**
• The study confirmed the presence of NK cells within atherosclerotic plaque and revealed that CD56 bright NK cells are the dominant subset.
• Soluble ligands have higher concentration in subjects affected by carotid stenosis.
• Symptomatic patients present higher concentration of ligands compared to asymptomatic.
• Further studies are required to confirm them as marker of plaque instability in the clinical practice.
Thank you for your attention