

# Atherosclerosis Risk Factors and Degrees of Stenosis in three Arterial Sites

Aikaterini Angeli and Nikolaos Doulamis  
National Technical University of Athens



## BACKGROUND

Atherosclerosis is a multifactorial degenerative arterial disease. Traditional risk factors and other agents, including bacteria of respiratory or oral origin, induce the various phenotypes. The correlation of the isolated atherosclerosis risk factors to carotid, peripheral and iliac atheromatosis along with the ultrasound – based degree of stenosis at the three sites have been analysed.

## AIM

**Aim of the study:**  
To investigate the role of independent traditional atheromatosis risk factors in three arterial sites. To investigate the role of independent atheromatosis risk factors in the degree of stenosis of three arterial sites. To investigate the relation among stenosis of various degrees in three arterial sites. To investigate the role of pharmaceutical regimens in the degree of arterial stenosis.

## METHODS

**Population**  
375 medical records – outpatient  
Symptomatic /asymptomatic (check up)

**Inclusion criteria**  
Full medical record  
Carotid and peripheral artery and iliac artery vascular ultrasound

**Degrees of arterial stenosis**  
<30%  
30-69%  
>70%

**Variables**  
Traditional risk factors (age, gender, smoking, pack years, hypertension, diabetes, dyslipidemia, obesity, renal failure)

Multifocal atheromatosis  
Heart disease / Vascular event  
Number of drugs taken for any disease/ drugs for atheromatosis risk factors

**Statistics**  
Mann Whitney U test has been used for statistical analysis.

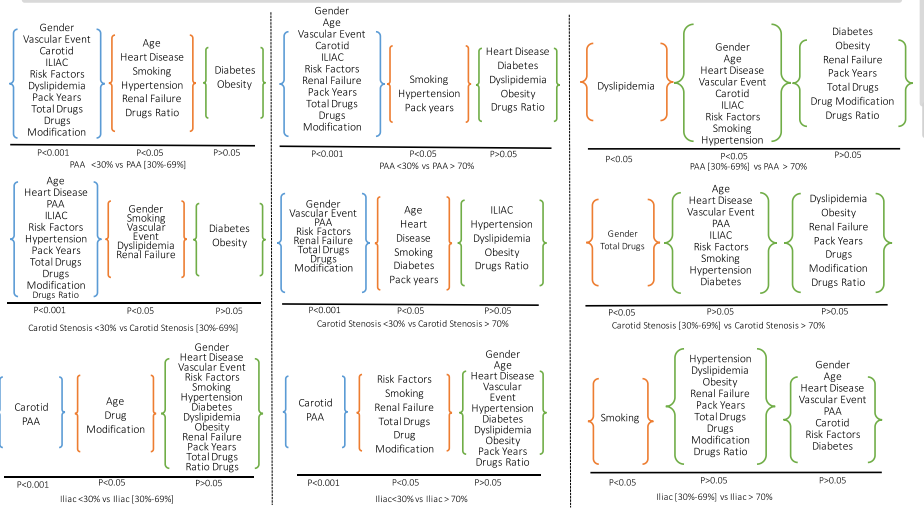
## RESULTS

For **CAROTID** and **PERIPHERAL** artery stenosis  
<30% vs 30-69% statistical significance for traditional risk factors  
30-69% vs >=70% no statistical significance for the majority of traditional risk factors

For **ILIAC** stenosis  
No statistical significance for the majority of traditional risk factors and for all degrees of stenosis

**Diabetes and obesity - the least significance**  
Among all risk factors  
For most degrees of stenosis of all arterial sites

**The highest statistical significance**  
Multifocal atheromatosis  
Pack years  
Number of traditional risk factors  
Gender  
Number of risk factor modification drugs  
Number of drugs for any cause



## CONCLUSION

Between **low** and **medium** degrees of **carotid** and **peripheral** arterial stenosis a **difference** has been documented in traditional atheromatosis risk factors. Between **medium** and **severe** carotid and peripheral arterial stenosis **no difference** has been documented in traditional risk factors. **Iliac** stenosis present **weak relation** to traditional atheromatosis risk factors for all degrees of stenosis. **Multifocal atheromatosis, pack years and coexistence of risk factors** present the highest statistical significance for all territories and degrees of stenosis. The **number of risk factor modification drugs** and the total number of **any cause drugs** is related to **all site medium and severe** degrees of stenosis. Further investigation of larger population samples and of additional risk factors (genetic, molecular, bacterial of respiratory, oral and drinking water origin, environmental and other) is required for **modelling individualized atheromatosis risk profiles**. Traditional laboratory and imaging techniques supported by new photonic technology could provide promising diagnostic and calculating modelling tools.

## ACKNOWLEDGEMENTS



This work is supported by the European Research Funded project H2020 WATERSPY: High sensitivity, portable photonic device for pervasive water quality analysis, grant agreement 731778.

## REFERENCES

- [1] R.M., Stoekenbroek, et al. "Heterogeneous impact of classic atherosclerotic risk factors on different arterial territories: The EPIC-Norfolk prospective population study," *European Heart Journal*, 37 (11), pp. 880-889, 2016.
- [2] W.B. Kannel, "Risk factors for atherosclerotic cardiovascular outcomes in different arterial territories," *European Journal of Cardiovascular Prevention & Rehabilitation*, 1 (4), pp. 333-339, 1994.
- [3] B.B. Lanter, et al. "Bacteria present in carotid arterial plaques are found as biofilm deposits which may contribute to enhanced risk of plaque rupture," *mBio*, 5 (3), 2014.

**Contact information**  
Aikaterini Angeli, MD  
Email: katerina.angeli.doulami@gmail.com