Real-World Utilization of Interleukin-6 Inhibitors in Patients with Abdominal Aortic Aneurysm

Mario Enrico Canonico, MD, PhD[1,2], Judith Hsia, MD[1,2], Ty J Gluckman, MD, MHA[3], Emil deGoma, MD[4], Marc P. Bonaca, MD, MPH[1,2]

[1]CPC Clinical Research, Aurora, CO, USA; [2] Department of Medicine, University of Colorado, Aurora, CO, USA; [3]CARDS, Providence Heart Institute, Providence Health System, Portland, OR, USA; [4]Tourmaline Bio, Inc, New York, NY, USA

BACKGROUND

Abdominal aortic aneurysm (AAA) represents a complex disease influenced by different factors including genetics, smoking, hypertension, age, and male sex. Inflammation has been identified as a driver across all stages of AAA, with interleukin-6 playing a role (figure 1). Presently, no approved medications have been shown to improve outcomes in patients with AAA through mitigation of inflammation. The current U.S. and European guidelines do not include any recommendation for anti-inflammatory therapy.[1,2]

Despite this, we sought to assess how often anti-interleukin-6/interleukin-6 receptor monoclonal antibodies (anti-IL-6/IL-6R mAbs) are used in patients with AAA for unrelated conditions.

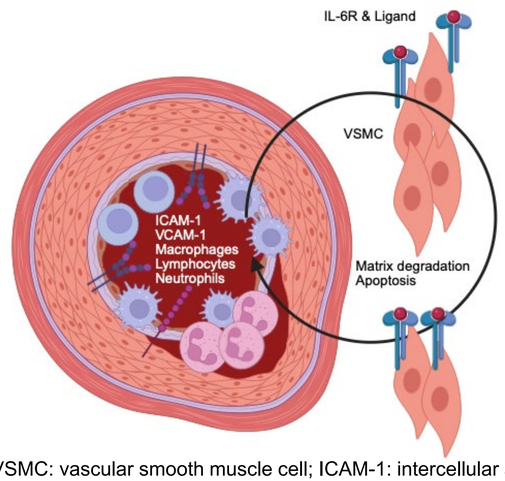


Figure 1. Role of IL-6 signaling and inflammation in AAA.

VSMC: vascular smooth muscle cell; ICAM-1: intercellular adhesion molecule-1; VCAM-1: vascular cell adhesion molecule-1. Created in BioRender.

METHODS

We extracted de-identified real-world data from TriNetX on adults with healthcare encounters with a diagnosis of AAA from 2018 to 2024 in the University of Colorado health system using AAA ICD-10 codes. We identified encounters without aneurysm repair, who underwent at least one AAA scan, and were on any approved anti-IL-6/IL-6R mAb for at least 1 year. Lastly, we stratified patients by their indication for an anti-IL-6/IL-6R mAb, their age at the last AAA scan, as well as cardiovascular (CV) comorbidities. The Colorado Multiple Institutional Review Board provided a waiver of informed consent.

RESULTS

Over a 6-year timeframe, 11,690 encounters for an AAA were identified, of which 27% had at least 1 AAA scan (n=2,950) and 95% did not undergo AAA repair. Concomitant use of an anti-IL-6R mAb (exclusively tocilizumab) was noted in 20 patients, mostly for rheumatoid arthritis, multiple myeloma and coronavirus disease.

All patients were aged ≥55 years at the time of their last scan, and 50% were female. Patient characteristics, including demographics, CV comorbidities, and anti-IL-6/IL-6R mAbs prescription, are summarized in table 1.

Table 1. Patient characteristics.

	UCHealth N=11,690
AAA without repair, n (%)	11,090 (95%)
- with at least 1 AAA scan	2,950 (27%)
- on any approved anti-IL-6/anti-IL-6R mAb	20 (0.7%)
- with duration of therapy at least 1 year	20 (100%)
Age, n (%)	
≥ 55y at last scan	20 (100%)
≥ 65y at last scan	10 (50%)
Female Sex, n (%)	10 (50%)
Smoking history, n (%)	
Active smoker	10 (50%)
Hypertension, n (%)	20 (100%)
Dyslipidemia, n (%)	20 (100%)
Diabetes Mellitus, n (%)	10 (50%)
Anti-IL-6/anti-IL-6R mAb use, n (%)	
Tocilizumab	20 (100%)
Sarilumab	0 (0%)
Satralizumab	0 (0%)
Siltuximab	0 (0%)
Indication for anti-IL-6/anti-IL-6R mAb, n (%)	
Rheumatoid arthritis	10 (50%)
Polymyalgia rheumatica	0 (0%)
Giant cell arteritis	0 (0%)
COVID-19	10 (50%)
Systemic Lupus Erythematosus	0 (0%)
Multiple Myeloma	10 (50%)

AAA: abdominal aortic aneurysm; mAb: monoclonal antibodies; IL-6: interleukin-6; IL-6R: interleukin-6 receptor; COVID-19: coronavirus disease-19.

REFERENCES

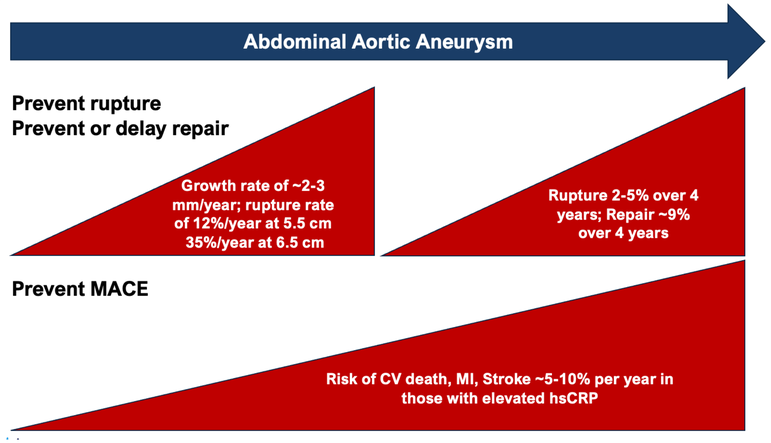
1) Isselbacher EM, et al. Circulation. 2022 Dec 13;146(24):e334-e482.
2) Mazzolai L, et al. Eur Heart J. 2024 Sep 29;45(36):3538-3700.
3) Dawson J. et al. J Vasc Surg. 2007 Feb;45(2):350-6.

DISCUSSION

In the real-world setting, the use of anti-IL-6/IL-6R mAbs in patients with AAA is rare and primarily prescribed for other conditions.

Evidence from previous studies indicates that IL-6 signaling plays a pivotal role in the pathogenesis of AAA. Patients with AAA demonstrated elevated circulating IL-6, with aneurysmal tissue playing a role for systemic secretion (figure 2).[3]

Figure 2. Potential for broad vascular benefits by IL-6 modulation in patients with AAA.



AAA: abdominal aortic aneurysm; CV: cardiovascular; MI: myocardial infarction; hsCRP: high-sensitivity C-reactive protein.

LIMITATIONS

The analysis was based on retrospective, pooled observational data lacking patient-level details. Furthermore, the findings are limited to a single large health system.

CONCLUSION

AAA is an inflammatory process and IL-6 represents a potential driver. Real world observations of patients with AAA receiving an anti-IL-6/IL-6R mAb may provide insights about targeting this pathway.

DISCLOSURES

MEC, JH and MPB receive salary support through their universities from CPC Clinical Research, a non-profit academic research organization affiliated with the University of Colorado.