

Cerebrospinal Fluid Markers of Neurodegeneration Associated with Postoperative Delirium in an Older Elective Arthroplasty Population

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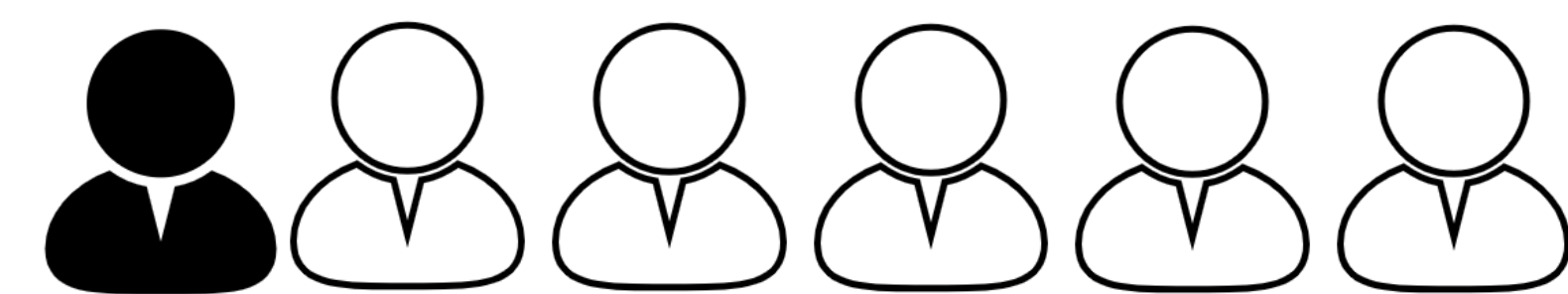
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Background

Postoperative Delirium

Delirium is an acute change in consciousness, which is fluctuating in nature and accompanied by disturbances in attention, perception and cognition [1]. Postoperative delirium (POD) is a common complication in older adults undergoing elective surgery, with an estimated incidence of 17% in elective orthopaedic surgery [2].

1 in 6
Post-operative Delirium



Delirium is associated with a host of long-term complications, including dementia [1]. It is not yet clear to what extent POD is due to **underlying neurodegeneration**.

This study

In 2012-2014, an observational cohort study of postoperative delirium (POD) in an **elective arthroplasty** population recruited **315 individuals without a diagnosis of dementia aged over 65**. Blood and CSF were sampled perioperatively and analysed for biofluid markers of inflammation and neurodegeneration.

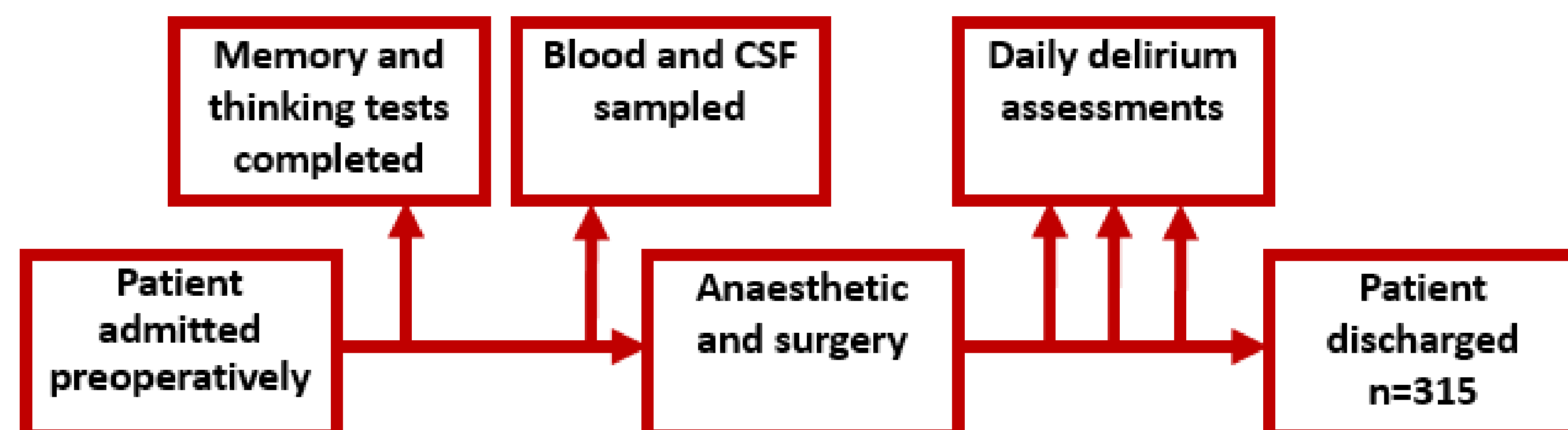
Aims



- Determine if CSF markers of **inflammation and neurodegeneration** preoperatively are associated with the development of POD

Methods

HSC Belfast Health and Social Care Trust **Observational Cohort Study 2012-2014**



CSF Inflammatory Markers*

- Interleukin-1 β
 - Interleukin-6
 - Interleukin-8
 - Tumour Necrosis Factor- α
- *n=90 missing data to be tested

CSF Neurodegenerative Markers

- A β 40 and A β 42
- Neurofilament Light (NFL)
- Glial Fibrillary Acidic Protein (GFAP)
- Triggering Receptor Expressed on Myeloid Cells 2 (sTREM2)

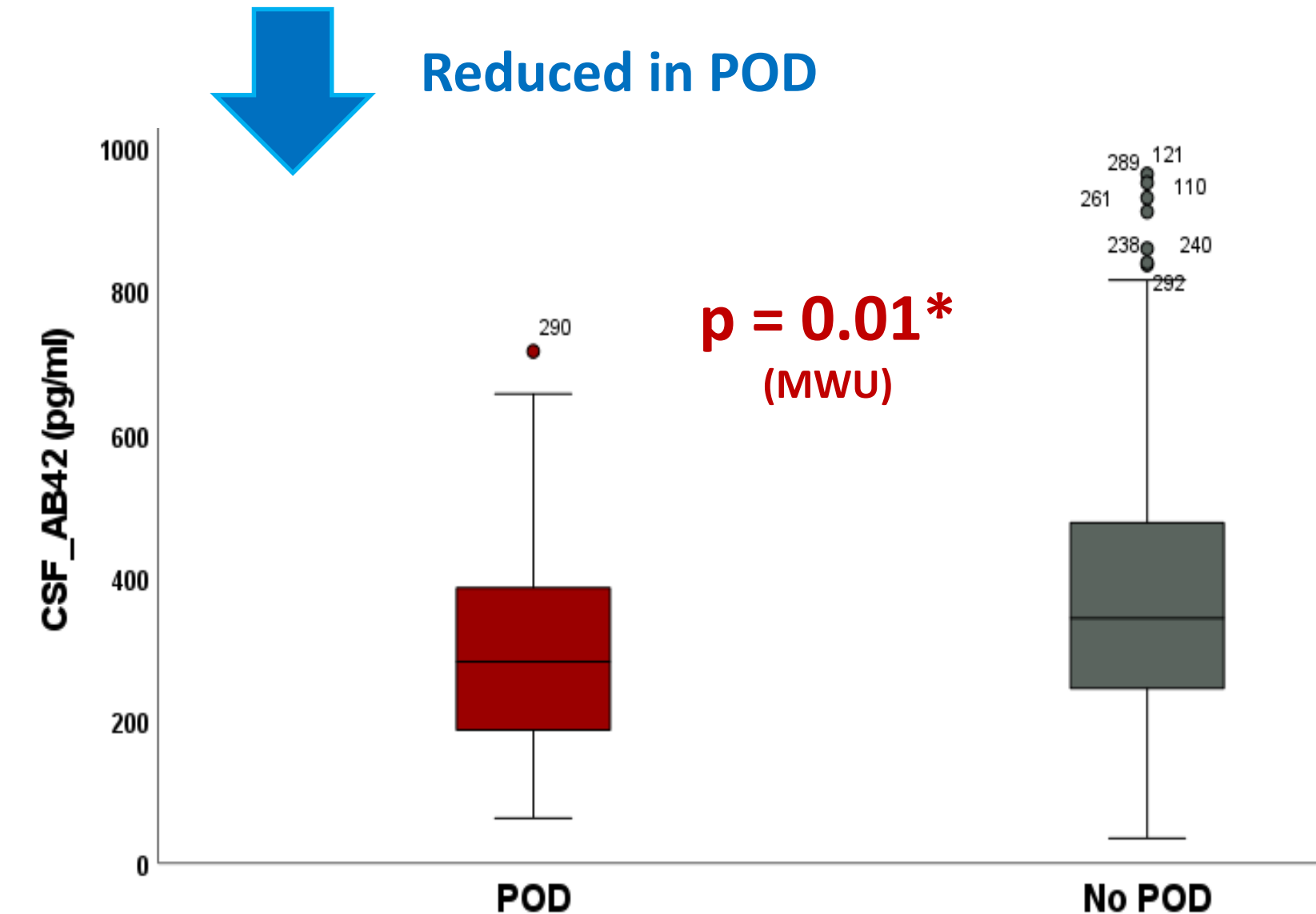
Results

74.2 years

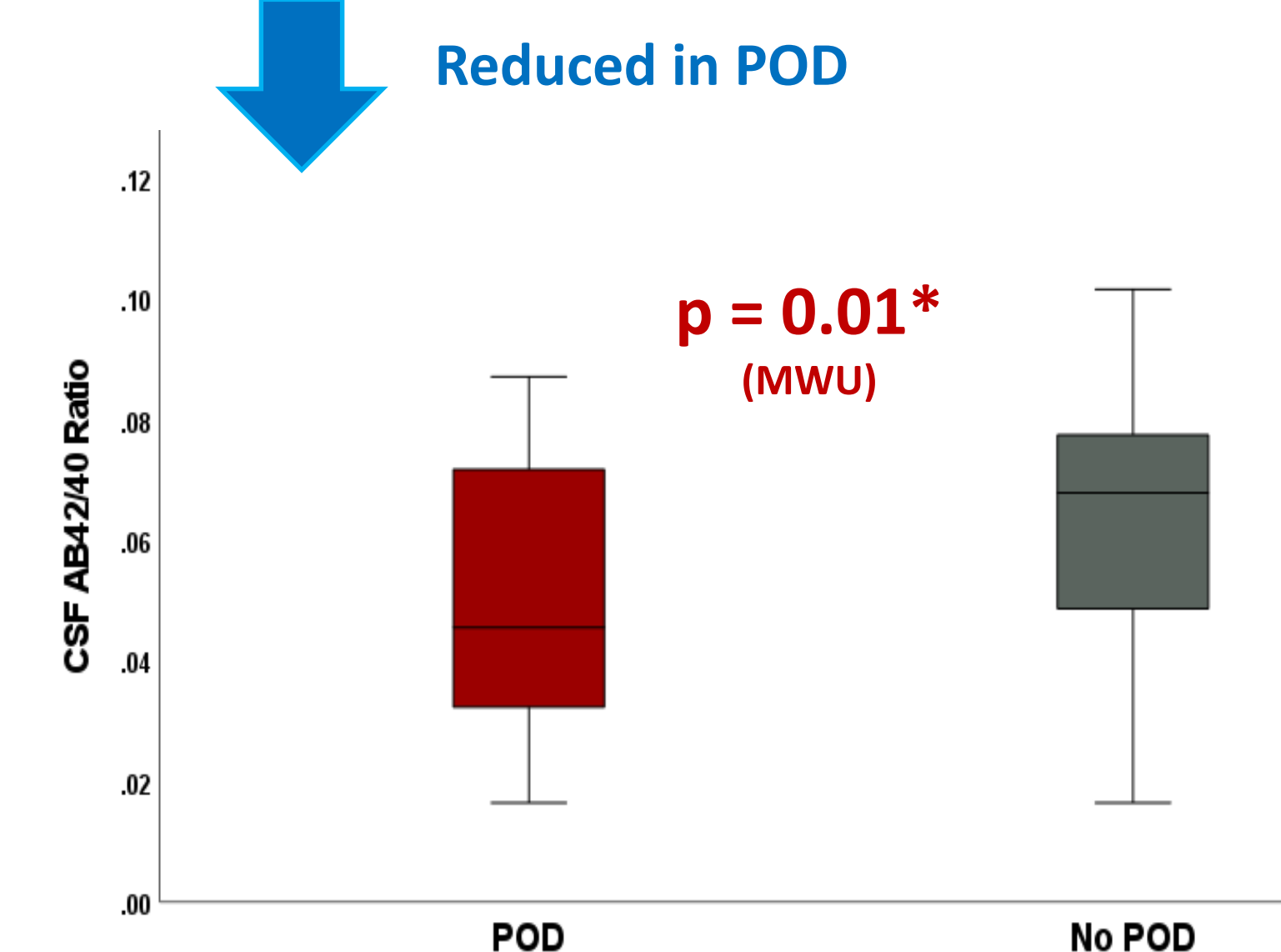
14%
(n=44)
POD

CSF Markers Significantly Associated with POD

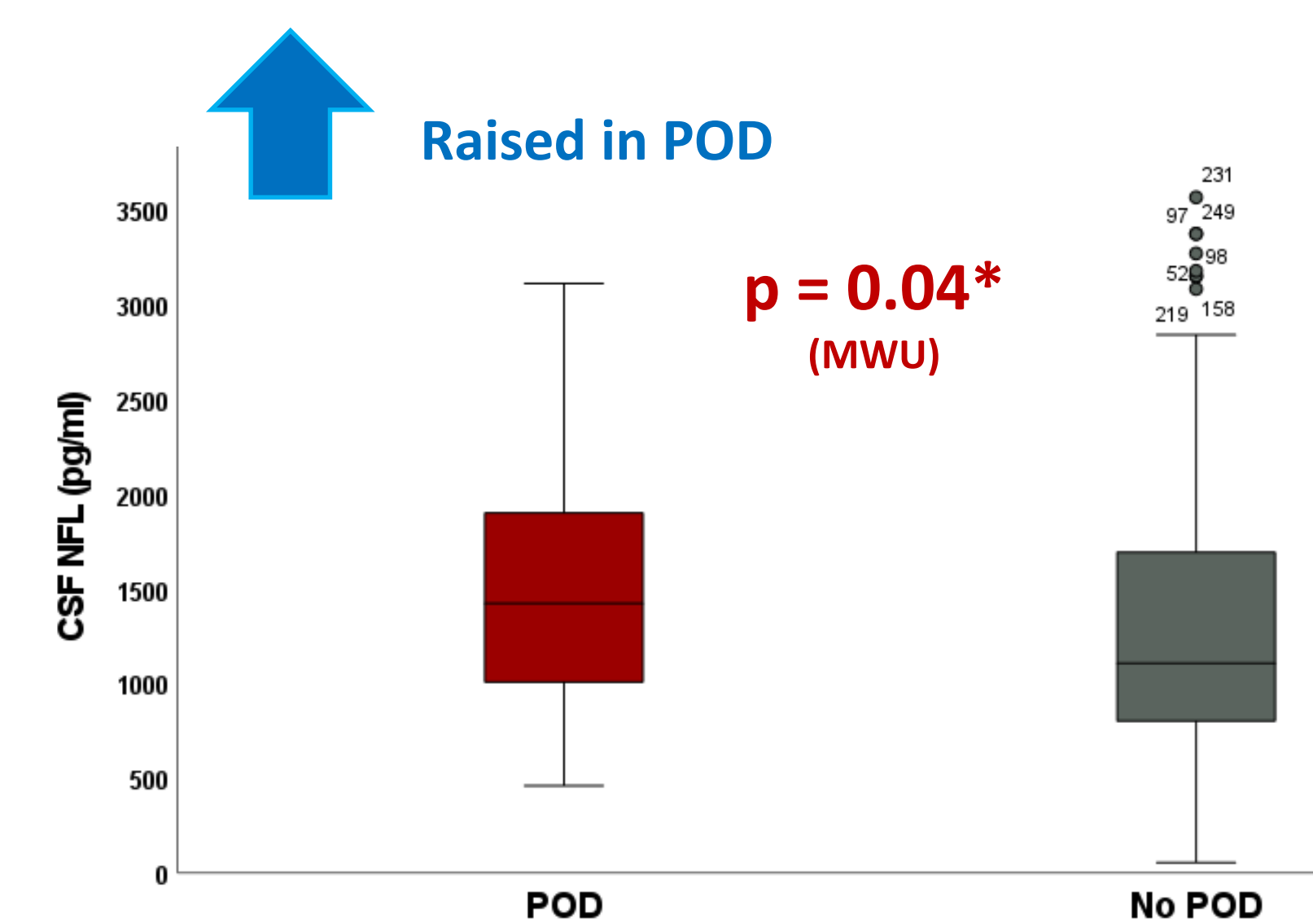
PreOperative A β 42 Concentration



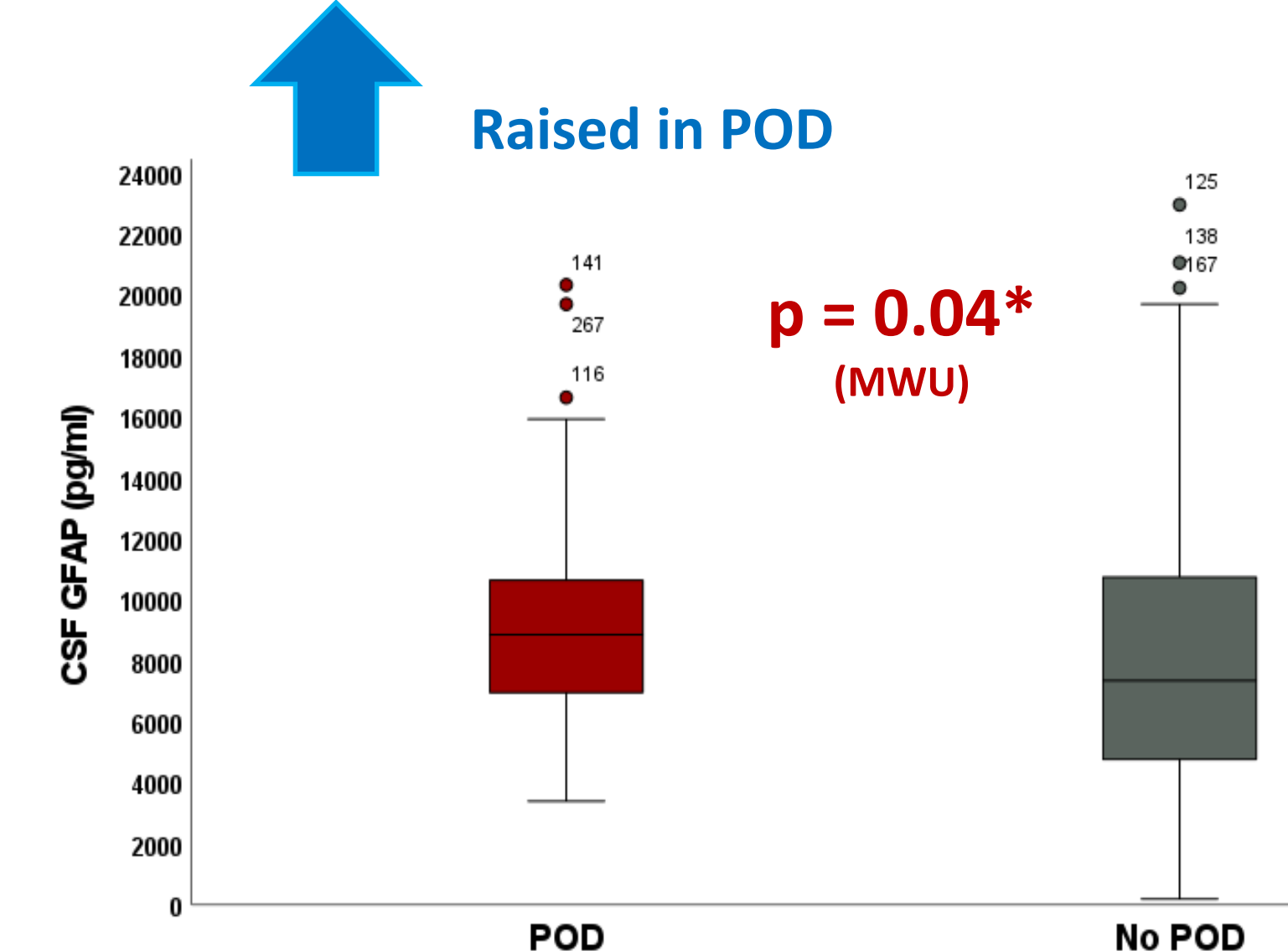
PreOperative A β 2/40 Ratio



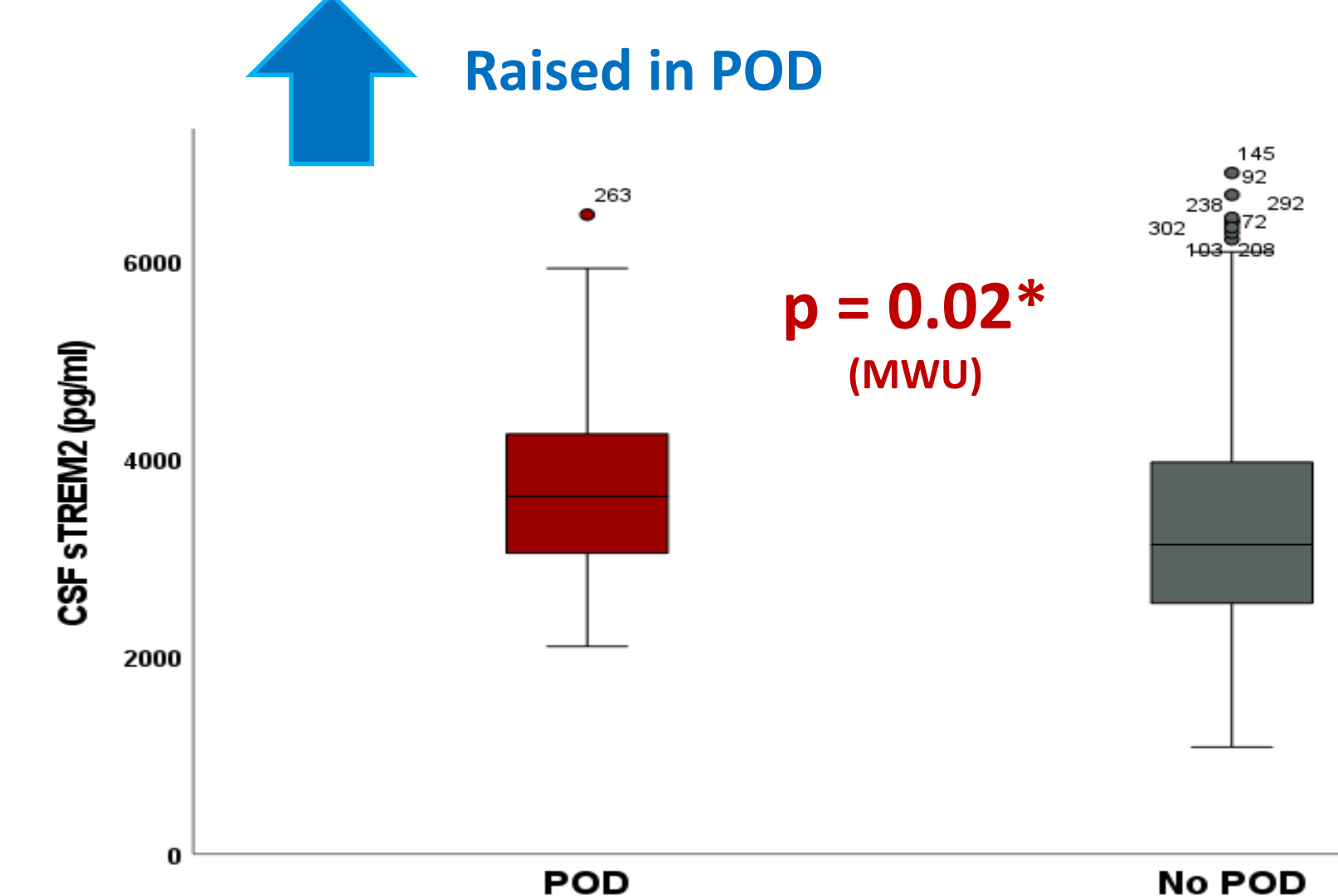
PreOperative Neurofilament Light



PreOperative Glial Fibrillary Acidic Protein



PreOperative Triggering Receptor Expressed on Myeloid Cells 2 (sTREM2)



CSF inflammatory markers interleukin-1 β , interleukin-6, interleukin-8, tumour necrosis factor- α were **not associated with POD** ($p < 0.05$), nor was preoperative A β 40.

Conclusion



People who develop POD after elective arthroplasty surgery had a profile of **preoperative CSF markers** in keeping with a **higher level of neurodegeneration**.

References

- Psychiatric AA. Diagnostic and Statistical Manual of Mental Disorders. In: 5th ed. Washington, DC: American Psychiatric Association; 2013.
- Scott JE, Mathias JL, Kneebone AC, 2015. Incidence of delirium following total joint replacement in older adults: a meta-analysis. *Gen Hosp Psychiatry*, 2015, 37(3), pp.223-9.

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