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# Association Between the ABO Blood Types and Post-operative Pain

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## Aim of Investigations

A number of genetic factors such as gender and hair colour have been associated with pain. ABO blood types have been linked to a diverse range of diseases such as various types of cancer, but only two studies have investigated a possible link between ABO blood types and pain.

To our knowledge, no studies have investigated if a certain blood type is associated with developing post-operative pain. However, two studies investigated the association between blood type and experimentally induced pain induced by a cold pressor test. The first study found no significant difference between the blood types and experimentally induced pain in healthy volunteers<sup>(1)</sup>, whereas the second study found a difference between the blood types<sup>(2)</sup>.

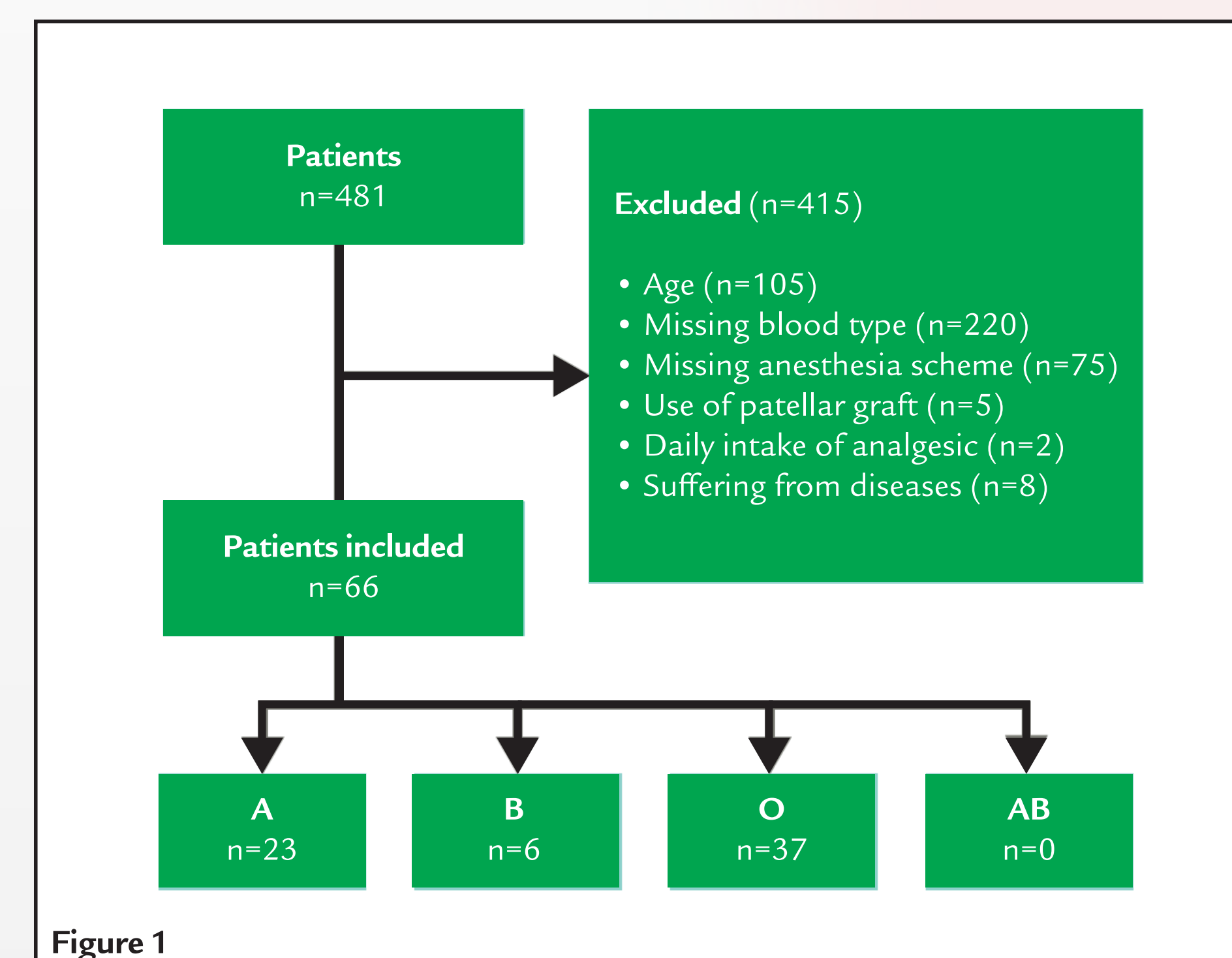
Thus, the aim of this study was to investigate if an association exists between a certain blood type and post-operative pain after arthroscopic anterior cruciate ligament reconstruction.

## Methods

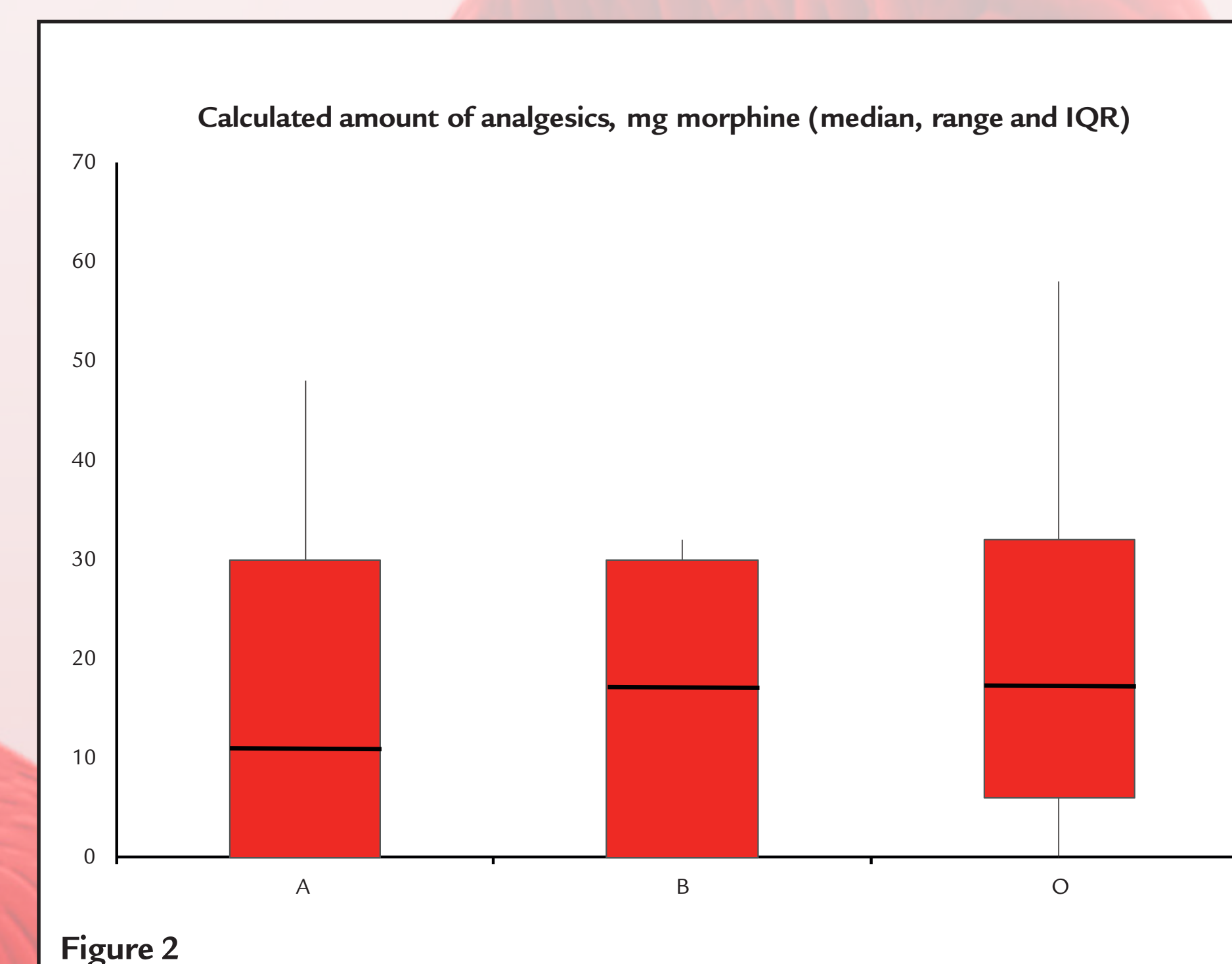
Patients (18–40 years) who had an anterior cruciate ligament (ACL) reconstruction at Aalborg University Hospital, Aalborg, Denmark between January 2012 and August 2017 were included in this retrospective study. Blood type and postoperative analgesic use were extracted from the patients' medical journals. The post-operative analgesics were converted to milligrams of morphine using equivalent doses for comparison between blood types and consumption of the analgesics. Sixty-six patients undergoing ACL reconstruction were divided into blood types A, B or O (Figure 1). None of enrolled patients had AB blood type.

## Results

No significant difference was found between a certain blood type and the number of post-operative analgesics consumed (p-value = 0.517). The median values 10, 18 and 18, for blood types A, B and O respectively, of the received post-operative analgesics indicated a difference between the ABO blood types (Figure 2). The mean ranks of the Kruskal-Wallis analysis of 30.17, 31.75 and 35.85 for blood types A, B and O, respectively indicated a difference between blood type A and O (p-value = 0.256), and B and O (p-value = 0.647). A two-way ANOVA showed no significant gender difference with an overall p-value of 0.179.



The mean amount of analgesics among blood type A was 22.21 and 13.07 for men and women respectively. This indicates men received a larger amount of post-operative analgesics than women. A post-hoc analysis revealed the difference was not significant (p-value = 0.206). The same tendency was observed for patients with blood type B. The means for blood type B were 24.00 and 12.32 for men and women respectively, not significantly different from each other (p-value = 0.395). Among blood type O, the number of post-operative analgesics for men and women were closely related, with means of 20.80 and 19.52 for men and women respectively (p-value = 0.805).



## Conclusions

Findings from this study demonstrated that patients undergoing ACL reconstruction with blood types A, B and O were not significantly different concerning consumption of post-operative analgesics.

The post-operative pain was considered based on the number of consumed analgesics, which indirectly reflected different intensities of post-operative pain. To make this factor comparable among the patients on different analgesics, the amount of each compound was converted to the milligram of oral morphine based on equivalent doses.

To verify the results, further research is needed, as this study had some limitations e. g. small sample size, and unequal distribution of patients among the blood types.

## References

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