Author’s response to reviews

Title: Quantitative evaluation method for clarifying ankle plantar flexion angles using anterior drawer and inversion stress tests: a cross-sectional study

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Quantitative evaluation method for clarifying ankle plantar flexion angles using anterior drawer and inversion stress tests: a cross-sectional study

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We appreciate the thoughtful and constructive feedback on our manuscript, titled “Quantitative evaluation method for clarifying ankle plantar flexion angles using anterior drawer and inversion...
stress tests: a cross-sectional study”, which has helped us improve our manuscript. Further, we wish to thank the reviewers for the time taken to review our manuscript.

Please find below our point-by-point responses to the comments below. We hope the revised manuscript is now suitable for publication in your journal.

Again, thank you for giving us the opportunity to strengthen our manuscript with your valuable comments and queries. We have worked hard to incorporate your feedback and hope that these revisions persuade you to accept our submission.

Sincerely,

Responses to reviewers

Reviewer 1

This is a well written manuscript which raises points of importance for a range of professionals

The abstract is clear and the introduction covers the main points

→We wish to express our appreciation to you for their insightful comments on our paper. The comments have helped us significantly improve the paper.

In the method, the demographic details (page 5) would be better placed in a table, for ease of reading. Otherwise this section is clear and well-laid out

→We appreciate your comment on this point and make a table to clear the demographic details.

Change before: Line121-126

The CAI group consisted of 18 men (n = 28 ankles; age, 20.9 ± 1.4 years; height, 174.2 ± 9.8 cm; weight, 71.0 ± 7.7 kg) and 17 women (n = 26 ankles; age, 20.4 ± 1.6 years; height, 158.2 ± 6.8 cm; weight, 58.0 ± 8.2 kg). The control group comprised subjects with no history of ankle sprain or lower limb surgery and included 22 men (n = 30 ankles; age, 20.4 ± 0.8 years; height, 173.1 ± 9.3 cm; weight, 68.1 ± 9.9 kg) and 23 women (n = 34 ankles; age, 20.7 ± 2.2 years; height, 154.6 ± 8.8 cm; weight, 55.3 ± 9.5 kg).

After change: Line122-123
We extracted two groups from them: 54 ankles (28 men, 26 women) with CAI and 64 uninjured ankles (30 men, 34 women) participated in this study (Table 1).

Table 1. Characteristics of the Chronic Ankle Instability and Control Groups

Results are clear - authors may wish to add a p value to statements (p 8) where there are significant differences, particularly if there is a very high (or quite low) level of significance

→We agree with you and have revised the sentence as requested.

Change before: Line195-196

The values were significantly higher in the CAI group than in the control group for both men and women.

After change: Line194-195

The values were significantly higher in the CAI group than in the control group for both men (P = 0.045) and women (P = 0.042).

Change before: Line201-205

When changing the ankle joint flexion angle at rest, the distance between the fibular lateral malleolus and talus was significantly higher in men than in women at 20° and 45° in the control group and at 45° in the CAI group (Table 3). The men and women in the CAI group showed significantly higher distances than those in the control group at ankle joint plantar flexions of 45° and 0°, respectively.

After change: Line200-204

When changing the ankle joint flexion angle at rest, the distance between the fibular lateral malleolus and talus was significantly higher in men than in women at 20° (P = 0.036) and 45° (P = 0.043) in the control group and at 45° (P = 0.034) in the CAI group (Table 4). The men and women in the CAI group showed significantly higher distances than those in the control group at ankle joint plantar flexions of 45° (P = 0.043) and 0° (P = 0.038), respectively.
Among men, length change rates between the fibular lateral malleolus and talus during the anterior drawer stress test were significantly higher in the CAI group at ankle joint plantar flexions of $20^\circ$ and $45^\circ$ (Table 4).

Among men, length change rates between the fibular lateral malleolus and talus during the anterior drawer stress test were significantly higher in the CAI group at ankle joint plantar flexions of $20^\circ$ ($P = 0.016$) and $45^\circ$ ($P = 0.033$) (Table 5).

Among men, length change rates between the fibular lateral malleolus and talus during the inversion stress test were significantly higher in the CAI group at an ankle joint plantar flexion of $20^\circ$ (Table 4)

Among men, length change rates between the fibular lateral malleolus and talus during the inversion stress test were significantly higher in the CAI group at an ankle joint plantar flexion of $20^\circ$ ($P = 0.029$) (Table 5)

The discussion compares the work well with the literature and the conclusion is supported by the data

→We wish to express our deep appreciation to you for your insightful comment on this point.
Reviewer 2

- In section abstract

The method it is no clear, the sample don't coincide with the analysis, Can you explain better this? You can give more information in this part of the abstract

→We appreciate your comment on this point. To clarify, we have added and changed the following text to abstract.

Change before: Line34-35

A total of 320 subjects (n = 320 ankles) were divided into two groups: control subjects without a history of ankle injury (n = 64 ankles) and subjects with CAI (n = 54 ankles).

After change: Line34-36

Questionnaires were provided to 160 healthy college students (86 men, 74 women; 320 ankles). We extracted two groups from them: control subjects without a history of ankle injury (n = 64 ankles) and subjects with CAI (n = 54 ankles).

- In the background section

Can you include the comparative data of other ligaments? You show the percentage of the ATFL but not the rest of the ligaments

→We agree with you and have revised the sentence as requested.

Change before: Line58-60

The most common causes of ankle sprains are ankle plantar flexion injuries and valgus injuries, with anterior talofibular ligament (ATFL) damage occurring in approximately 65–73% of cases [6, 8].

After change: Line58-61

The most common causes of ankle sprains are ankle plantar flexion injuries and valgus injuries, calcaneofibular ligament (CFL) damage occurring in approximately 2% of cases [6], in contrast with anterior talofibular ligament (ATFL) damage occurring in approximately 65–73% of cases [6, 8].

In section method

I'm sorry but I don't understand the sample, I think that in the CAI group is because the ankle were injuries but in the control group why do you analysis 22 men but only 30 ankle or the same in the women? Can you clarify this?

→Thank you for your valuable comments. We agree with you and have incorporated these suggestions throughout our paper. In the control group of men, 8 out of 22 men had no injury history on both ankles, and 14 had no injury history on only one ankle, making a total of 30 ankles. Same as women control group, 11 out of 23 women had no injury history on both ankles, and 12 had no injury history on only one ankle, making a total of 34 ankles.

Change before: Line121-126

The CAI group consisted of 18 men (n = 28 ankles; age, 20.9 ± 1.4 years; height, 174.2 ± 9.8 cm; weight, 71.0 ± 7.7 kg) and 17 women (n = 26 ankles; age, 20.4 ± 1.6 years; height, 158.2 ± 6.8 cm; weight, 58.0 ± 8.2 kg). The control group comprised subjects with no history of ankle sprain or lower limb surgery and included 22 men (n = 30 ankles; age, 20.4 ± 0.8 years; height, 173.1 ± 9.3 cm; weight, 68.1 ± 9.9 kg) and 23 women (n = 34 ankles; age, 20.7 ± 2.2 years; height, 154.6 ± 8.8 cm; weight, 55.3 ± 9.5 kg).

After change: Line122-123

We extracted two groups from them: 54 ankles (28 men, 26 women) with CAI and 64 uninjured ankles (30 men, 34 women) participated in this study (Table 1).

Table 1. Characteristics of the Chronic Ankle Instability and Control Groups

Can you include the number and the name of ethic committee?

→Thank you for your helpful comments. We have added and changed the sentences to make clear.

Change before: Line128-130

The study was approved by the ethics committee of our university, and the research was conducted in accordance with the tenets of the Declaration of Helsinki.

After change: Line125-128
The study was approved by the ethics committee of Niigata University of Health and Welfare (no. 17798-170285), and the research was conducted in accordance with the tenets of the Declaration of Helsinki.

- Can you include the viability of this tool the Telos stress device (Aimedic MMT Co., Ltd., Tokyo, Japan) and the joint angle meter (Takase Medical Co., Ltd., Tokyo, Japan)

→Thank you for your valuable comments. These materials are very common to use for this research field; however, we thought we need to show the test reproducibility for our paper because the way of measurement is not common.

Test reproducibility: Line166-173

A total of 20 men (age, 20.8 ± 1.3 years; height, 175.1 ± 3.9 cm; weight, 72.3 ± 6.9 kg) and 20 women (age, 20.4 ± 1.5 years; height, 163.1 ± 3.9 cm; weight, 58.1 ± 5.6 kg) who did not have ankle joint pain were investigated with respect to measurement reproducibility of length change rates at ankle joint plantar flexion angles of 0°, 20°, and 45°. Three measurements were obtained, and the average value was used, similar to the method employed to measure length change rates of the fibular lateral malleolus and talus. Measurements were repeated at 2 days after the first measurement to verify their reproducibility.

Verification of measurement reproducibility: Line186-189

The ICCs (1, 3) for the length change rates of the fibular lateral malleolus and talus ranged from 0.875 to 0.949 (Table 2). According to previous research criteria, our measurement reproducibility was high because reproducibility is considered almost perfect when the ICC is 0.81 or higher [22].


- How did you calculate the sample size, can you include this in the text?

→Thank you for your suggestion. We have added the sentence how did we calculate the sample size.

Add the sentence: Line175-176

The sample size was performed using Ene 3.0. The required sample was determined taking as a reference the data reported by de Noronha M [21].

- Statistical analysis

- How was the test about the normality? Can you include this information?

→Thank you for your suggestion. We have added the phrase to the " using the Shapiro-Wilk test ".

Change before: Line177-181
The distance and length change rates of the fibular lateral malleolus and talus were tested for normality with respect to plantar flexion angles in each group.

After change: Line176-178
The distance and length change rates of the fibular lateral malleolus and talus were tested for normality using the Shapiro-Wilk test with respect to plantar flexion angles in each group.