Author's response to reviews

Title: A shallow chest correlates with right thoracic curvature in the normal spine: Features resembling those observed in structural scoliosis

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Author's response to reviews: see over
A shallow chest correlates with right thoracic curvature in the normal spine:
Features resembling those observed in structural scoliosis
Toshio Doi, Osamu Tono, Kiyoshi Tarukado, Seiji Okada, Kensuke Kubota, Katsumi Harimaya, Yoshihiro Matsumoto, Mitsumasa Hayashida and Yukihide Iwamoto

Dear The Scoliosis Editorial Team,

Thank you for your email of May 15, 2014, regarding our manuscript, “A shallow chest correlates with right thoracic curvature in the normal spine: Features resembling those observed in structural scoliosis”, and the valuable comments of the four reviewers. I attach here our revised manuscript, as well as a point-by-point response to the reviewers’ comments.

We feel that the revised manuscript is a suitable response to the comments, and is significantly improved over the initial submission. We trust that it is now suitable for publication in the Scoliosis.
Thank you in advance for your kind consideration of this paper.

Sincerely yours,

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RESPONSE TO Referee 1:

Comment: This paper does not bring anything since similar publications from the past”. As far as saying that “rib cage development is a causative factor of idiopathic scoliosis” it is not supported by the described data.

Response: We are very sorry to hear the negative comment by referee 1. We did this study to try to find out a causative factor of development of right thoracic AIS. Similar publication from the past did not study the correlation of ribcage deformity and right thoracic curvature in normal spine. This study is cross-sectional study, and so, it cannot say which deformity is causative or effect, however, we believe these data is important of the basic knowledge of trunk and spine deformity.

RESPONSE TO Referee 2:

We wish to express our appreciation to the Reviewer for his insightful comments, which have helped us significantly improve the paper.

Comment: I would recommend with minor essential revisions in such as rephrasing the second half of paragraph one say to, - Left shift (1-4) although the causal relationship between chest deformity, scoliosis and aortic position is unknown these relationships have already been discussed in another publications(5).

Response: In accordance with the Reviewer’s comment, we have resected and shortened the text in the Background:

The causal relationship between scoliosis and chest deformities is unknown; however, correlations between a flat chest, the aortic position, rib cage rotation and right thoracic curvature have been reported[5].

We wish to thank the Reviewer again for his or her valuable comments.
RESPONSE TO REVIEWER 3:
We wish to express our appreciation to the Reviewer for his insightful comments, which have helped us significantly improve the paper.

Comment 1: Why did the patients have CT scans?
Response: We cannot correctly answer this point. We could only access to the CT and radiographical database who came to our hospital. The reasons to radiograph may include, flue, general fatigue, pre-operative screening, metastatic screening, a medical check up, etc, however, we could not investigate each reason why they had chest CT scans and chest radiograph.

Comment 2: The measurements, apparently reported fully in a previous paper by the authors and not available to me. They, are described “briefly”, so briefly that I do not understand how the aortic position was measured.
Response: We showed the illustration of the figures and explanation how to measure the aortic location in “method” section as follows “To measure the aortic location (a), we marked the center of the aorta on the neck of the rib, then determined the distance from the rib head (positive in value if found on the anterior-right side).”

Response: We cannot access the paper “Anthropometry, Spine: State of the Art Reviews 4(2):411-421. However, we believe not only the decreased AP chest diameter but the correlation of the deformity is important findings in our paper.

Comment 4: In Figures 4 and 5, “agnel” spelling correction needed
Response: We have corrected the errors of spelling.

We wish to thank the Reviewer again for his or her valuable comments.
RESPONSE TO REVIEWER 4:

We wish to express our appreciation to the Reviewer for his insightful comments, which have helped us significantly improve the paper.

Comment 1: The patients who were enrolled in this study might be those who had visited the authors’ hospital to take chest radiographs and CT scans for investigating other diseases. They were not patients with and sort of spinal deformity. If so, how can the authors conclude that such small curves have some possibility to progress in the future? Considering measurement errors of Cobb angles on AP chest x-ray films, 3 degrees of scoliosis curve on average must be within measurement errors.

Response: We do not want to conclude such small curves in adult have some possibility to progress in the future. We think the spinal curvature mainly progress in adolescent period, however, it is difficult to follow the time course of individual scoliosis patients before the tangible stage. We want to show the correlation of small right thoracic curvature and rib cage deformity even in normal patients in mature adult. The reason why we collect the patients aged form 20 to 29, is they are fully matured. As we mentioned in the “background” section, if thoracic right curvature is correlated with rib cage deformities, as is observed in patients with AIS, normal spinal deformities would constitute a model for the tangible stage of AIS development.

The curvature is very sever in scoliosis patients, and we agree “considering measurement errors of Cobb angles on AP chest x-ray films, 3 degrees of scoliosis curve on average must be within measurement errors.”

In this paper, we measure the normal patients. For measuring Cobb’s angle in normal spine patients reliability, we have study in the previous report (reference 8) that the interclass correlation coefficient for the intraobserver reliability of the Cobb angle measurements using chest radiograph was 0.61-0.81, and the interclass correlation coefficient for the interobserver reliability of the Cobb angle measurements using chest radiographs by the three observers was 0.70 (0.61-0.79).
**Comment 2:** More precise background of the patients should be documented in the manuscript. These are not normal subjects and visited their hospital for other clinical purposes.

**Response:** We cannot correctly answer this point. We could only access to only the CT and radiographical database who came to our hospital. The reasons to radiograph may include, flue, general fatigue, pre-operative screening, metastatic screening, a medical check up, etc, however, we could not investigate each reason why they had chest CT scans and chest radiograph.

**Comment 3:** The age range of the patients was 20 to 29 years. As well as their spinal deformity is too small to define as a true scoliosis, they are already mature so that the possibility to their curve progression is very slim.

**Response:** We have answered to the comment 3 in the response to the comment 1.

We wish to thank the Reviewer again for his or her valuable comments.