Author's response to reviews

Title: A new brace treatment similar for adolescent scoliosis and kyphosis based on restoration of thoracolumbar lordosis. Radiological and subjective clinical results after at least one year of treatment.

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Version: 2 Date: 3 June 2012

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Cover letter on submission First review on manuscript 3271490856731450:
A new brace treatment similar for adolescent scoliosis and kyphosis based on restoration of thoracolumbar lordosis. Radiological and subjective clinical results after at least one year of treatment.
Piet JM van Loon, Monique Roukens, Joop DJ Kuit and Frederik BTM Thunnissen.

Oosterbeek, 31 May 2012
Dear Scoliosis Editorial Team,
On behalf of my co-authors I thank the Editorial team to give the opportunity to get our results and manuscript readmitted with the advises and comments of the referees.
We will give the responses on their advises, questions and concerns hereby, separated for each referee if necessary.
First of all the English and the structure of sentences is revised and in the introduction and the discussion some textual improvements are made.

Referee 1., Dr. Daniel Zarzycki:
The comment on the preliminaries of the results are further commented in the manuscript. All patients were treated unto end of growth, but for purposes to get preliminary results for this complete change of regimen and technique, only the group of children treated at least one year was big enough to get statistical evidence. In a nationwide decline in capacity and willingness to treat these deformities, both conservative and operative, different hospitals skipped these treatments for economic reasons without a well designed reorganization or centralization plan. The main author did not succeed to get a restart until this year. The Dutch Scoliosis Association (patients) succeeded to get attention on this in Government and Parliament.
The inclusion criteria are disputed. In the article it is now explained, that first corrective tests, leading to our study in Spine 2008 showed, that even in Risser 4 and 5 forced lordosis gave correction. Remodeling of a deformed spine has a better change in early cases, when growth will act as a partner, but remodeling of bone can occur at any age in a lower speed.

The same comment can be given on his remark on the sometimes high magnitude of curves. First of all we want to make a “statement” that what is or was true for other braces in SRS the recommendations will not have to be true for a complete different technique. The aim is not to prevent surgery in such high magnitudes in the first place, but to correct as much as possible the sagittal contour and the mobility of the spine and to postpone surgery. Some girls in our practice decided to go on with brace treatment after Risser V, because of the gradual improving posture, muscular condition and curves. Further improvement of the sagittal posture by unloading the discs will give a better endurance of the system and can prevent, even in cases that will go on for surgery the occurrence of “flat spine syndromes” or junctional kyphosis.

The curves were not matched individually as the referee states. This is only possible and of importance if this group will be revisited after stopping for one of more years.

The question on the postural treatment can be answered shortly and lead to some improvements of the text. There is ample experience with exercises in many countries and the recent article of Mordecai missed any understanding of the reason no direct corrective response in data with evidence on correction of scoliotic curves will be achieved by exercises alone, as this adjuvant therapy is focused on amelioration of gross posture, gross condition of muscles in their balancing tasks. By that it could not influence the effect of the correcting forces of our brace but in a positive way. Other measurements should be added in studies, like muscle power, mobility and gross postural balance to give more evidence of its value.

We also point at the differences in mobility in a TLI brace comparing to other rigid braces. Children do show an almost normal mobility of the spine, improving when the consecutive changes are made during controls and the brace is shortened. Only flexion is hindered almost completely in this brace on purpose.

On his last remark we put more emphasis that these results should be called preliminary, as we changed it in the text.

Referee 2. Dr. Peter John Papantoniou:

We made corrections in the language. We understand his difficulties to understand the meaning, because we are well aware, that too many subjects are changed in comparison to earlier brace-studies. When in a study new or different etiologic factors are introduced and even two, till now separately described and researched deformities are put together and focus changed towards more knowledge of the sagittal contour and functionality of the spine, we had to create other descriptions.

We will be glad to get our statistical data send to the Editorial Team. If demanded
it will be send on CD-rom or by Internet (We Transfer).

In the Minor Essential Revisions the description of “a specific” brace in Material and Methods is made more clear by calling its by its name, which includes the function. We deliberately avoid to name this brace to any city, inventor or marketing items. The name describes its way of action.

Not to much literature is present to justify the conjunction of the two adolescent deformities. The negligence of the almost endemic kyphotic deformities needs some correction in the spinal deformity dedicated societies and in all day practice. The ISICO study of Atanasio et al. on the frequent combination of these two presented at the last SOSORT meeting gave supporting data. Their references on this was meager too. Whilst in the nineteenth century both conditions were described as load dependant alterations the later newly introduced “idiopathy” blurred this knowledge for some time.

The direction of the arrow \( p>0.001 \) in results is changed in \( p<0.001 \) and is a typing error.

Mentioning also percentages of reduction was added in accordance to other brace studies. Although the range of values is large, the mean and SD in correlation with the number of included children in the groups, it shows at least a firm trend.

For the results of the questionnaire, only briefly stated in the main text, here the complete table with numbers and percentages is presented. (++ means very satisfied in code A, very much agree in code B, of great value in C and very certain in D and so on.

code I II III IV V missing VI
Satisfaction on whole treatment A 24 26.4 53 58.2 5 5.5 4 4.4 1 1.1 4 4.4
Satisfaction on informed consent A 33 36.3 49 53.8 4 4.4 0 0 1 1.1 4 4.4
Satisfaction on role orthotist A 41 45.1 43 47.3 3 3.3 0 0 0 0 4 4.4
Satisfaction on overall result A 31 34.1 41 45.1 9 9.9 6 6.6 0 0 4 4.4
Perception visible result A 15 16.5 43 47.3 21 23.1 6 6.6 2 2.2 4 4.4
Perception general health status B 46 50.5 29 31.9 7 7.7 1 1.1 0 0 4 4.4
Comfort/ easyness of brace B 1 1.1 10 11.0 42 46.2 23 25.3 11 12.1 4 4.4
Importance counseling postural therapist C 38 41.8 21 23.1 17 18.7 9 9.9 2 2.2 4 4.4
Choice for same treatment D 26 28.6 43 47.3 5 5.5 5 5.5 8 8.8 4 4.4

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rel % whole treatment 26 58 6 4 1
rel % informed consent 36 54 4 0 0
rel % role orthotist 45 47 3 0 0
rel % overall result 34 45 10 7 0
rel % visible result 17 47 23 7 0
rel % perception gen. Health status 51 32 8 1 0
rel % easyness of wearing 1 11 46 25 12
rel % counseling postural therapist 41 23 19 10 2
rel % choice for same treatment 27 47 6 6 2

Drie belangrijke items uitgesplitst (Three main items divided in Group A and B) naar A en B, uit uitdraai

Group A (scoliose>25)
rel % whole treatment 26 52 3 5 3
rel % overall result 32 37 8 13 0
rel % easyness of wearing 0 8 47 21 13

Group B (kyphosis and/or scoliosis <25)
rel % whole treatment 24 63 5 3 1
rel % overall result 32 48 9 8 0
rel % easyness of wearing 1 11 47 25 11

Referee 3. Dr. Hans Rudolf Weiss:
The major Compulsory revisions of the referee are provided with similar looks and feelings on the importance of correcting coronal curves via the sagittal contour. Besides that we share for sure that opposition of Dickson's paradigm on the impossibility of proper bracing of scoliosis because of the existence of a hypokyphotic or even lordotic part of the spine at the level of the thoracic apex is worthwhile. The natural and optimal sagittal curvature with its better functional and cosmetic aspects in the presence of an extended lordosis into the thoracic area in stead of a kyphotic thoracolumbar joint as part of an extended kyphosis into the lumbar area is of no dispute between our observations and that of the referee.

We started with mentioning only the Cochrane study of SOSORT members on bracing, were the Lordotic approach is not mentioned. The main difference with the approach of the referee is the described evidence of the existence of a thoracolumbar kyphosis in any scoliotic adolescent spine as confirmed on the base of our study on our corrective force in Spine 2008 by the group of Ni in Sjanghai in 2010 which lead to our focus on this event in the first place. Besides that he stated in his article in Orthopaedie Technik

The referee doesn’t comment on the more dynamic type of correction we offer: by putting pressure only at the thoracolumbar joint and by shortening the brace at the backside the lumbosacral profile (clinical and radiological) at most controls a fair amount of normal motion during all day activity (except flexion while sitting)
is possible. There are no parts above the thoracolumbar spine and no rigid parts in the thoracic region besides the sternal bar which has an anvil action in the prevention of flexion.

We thought it was not necessary to put a discussion on all different aspects of form of other types of braces in the manuscript itself. Any reader can make his own comparison on any aspect of their brace in use with TLI. We plea for acceptance of some other etiologic and morphogenetic factors out of our lifestyle on which the CNS has to react. To bring opposition to longstanding paradigm’s in knowledge on scoliosis and make an attack on the almost sacral “idiopathy” will give at first strong counter reactions in own surroundings. By that the question of the referee why it took so long to publish these data is answered.

Referee 3. Dr Yan Wang

In his recognition of the difference in approach in TLI comparing with previous braces and his encouragement for publishing we are grateful to this referee. We expect other support from Chinese scientists on the changing knowledge on etiology and morphogenesis of optimal postures and the increasing amount of deformities in their country.

With these comments on the truly appreciated remarks and with the undertaken changes in language and understandability of some parts of the text, we hope SCOLIOSIS will accept the manuscript for publishing.

On behalf of my co-authors,
Greetings,
Piet J.M. van Loon