

Q&A: Inaugural SRS Research Grant Outcome Symposium

March 6, 2021

**1. Has anyone tried crowdsourcing data from patients to include natural curve progression past the age of 20 years?**

Not, as far as I know. In fact, my idea would be to start a project like this inside the SRS and SOSORT, and I hope to be able to discuss this option during the next Non-Op Committee Meeting, since Natural History data are crucial mostly for conservative treatment. We performed a study that hopefully will be accepted at the SRS with our own data, and there are a couple more in the literature.

**2. How will the trajectory of the curve progression be available to patients and their care providers?**

As soon as it will be ready. We are now working hard on it, and hope to be ready for the next SRS Meeting

**3. Do you think that the progression of the curve would be similar in children with a neuromuscular or syndromic scoliosis? I would imagine that growth is the same in both groups.**

Yes, growth is the same, but etiology totally different. Moreover, usually the morphology of the curve is different, and that could also play a role in the biomechanics. So, this is a good reason to explore. Nevertheless, the original curve of Duval-Beaupère was developed in neuromuscular scoliosis, and our results are quite close to those. So, space for research there.

**4. Did you use RRC or Sanders's scores?**

Unfortunately we could use only the spine radiographs, since it was a retrospective study.

**5. Beside Cobb angle are correlations from blood analyze results (biochemistry), nutrition problem or just cobb angle?**

Our study was based only on the coronal radiographs - no other data available unfortunately.

**6. Dr. Negrini, very impressive endeavor. What is longest follow up in your database? and how do you incentivize patients in their adulthood and advanced age to keep following up?**

Our database has existed since 2003, so the longest clinical follow-up is 17 years now. The only incentive for patients is their health, so you lose many of them in the short term, but many also come back after some long time

**7. Very interesting and difficult topic. Did you notice higher worsening of the scoliotic curve during growth spurt? And did you consider vertebral rotation as well as possible predictive model? Thank you in advance.**

Unfortunately we did not measure vertebral rotation, since we don't use it regularly in our practice and the number of x-rays was really huge - I think this is a new advance to be considered in the next future. According to our provisional data, yes: there is greater worsening during growth spurt.

**8. We divided the standard Risser sign into 3 categories (A= Risser 0, Open TRC; B= Risser 0, closed TRC - Risser 1 and C= Risser >1) which seems to match your three groups. Is it similar to your classification or is yours based on age?**

The SRS-SOSORT Consensus in 2014 defined the Risser+, where your A is Risser 0-, your B is Risser 0+, and your C is Risser 1. So what you do has already been standardized some years ago. We use the same in clinical practice. Unfortunately in our sample we did not have enough triradiate cartilage imaging to be able to include them in the analysis

**9. Do you divide the groups due to mobility-flexibility? Is it possible to say more flexibility is a risk factor?**

This was not in our research project, that is based on a retrospective collection of x-ray images.

**10. Does Dr. Negrini's group intend to adapt this model to prospective use via AI clustering techniques?**

This is an hypothesis we are exploring with a group of AI experts - it will be the next step forward, possibly.

**11. Are sagittal parameters possible within this data set? Thank you Dr. Nigrini. Important work.**

We based our research only on coronal x-rays, to have the maximum of number possible. The next step could really include the sagittal plane as well.

**12. Were non op patients recruited from conservative treatment settings or from consulting at the surgeons' office? Does your study reflect preoccupations of adults seeking conservative treatment?**

All patients were recruited from consulting at the surgeons' offices. The study was a qualitative investigation of presenting symptoms, limitations and expectations for treatment in patients with adult spinal deformity towards creation of a linear and unidimensional outcome score. Pre-occupations with a particular type of treatment is not part of outcome measurement in this context. The methodology is in fact designed to rule out such pre-occupations because if they were influencing the responses to the score items then conservative and surgical groups could not be compared as their responses would be confounded.

**13. What was the comparison in pain between surgical and non-surgical patients in this study?**

This was a qualitative study with the aim to identify what matters to patients, so we did not compare this.

**14. For Dr. Rothenfluh, given that the large number of key domains that you derived are inherently linked to physical function, do you think that this methodology would benefit from the additional consideration of objective functional outcomes like gait and balance data?**

Objective functional data is absolutely desired, but by definition is not part of a PATIENT-REPORTED outcome score. In addition, it is unlikely that subjective and objective data can be integrated in one instrument unless it meets the psychometric properties of unidimensionality and linearity. I know there are outcome scores in orthopedics that do that, but they have never been evaluated for and in all likelihood do not meet modern psychometric requirements.

**15. Dr Rothenfluh, for your patients with AIS who had surgery, what proportion of them had selective thoracic fusion, and do you have enough power to compare the outcome in adulthood between patients who had selective fusion vs. longer fusion into the lumbar spine?**

This was not the scope of the study. The goal here was not to compare treatments, type of fusions, but to create the measurement tool that is designed and validated to allow such comparisons in the future. This requires a unidimensional and linear score which is specific for the underlying condition.

**16. Great work Do you intent to limit the questionnaire to a limited amount of questions**

Absolutely, the next step will be 'item reduction' of a preliminary questionnaire.

**17. The fact the alveolar numbers can increase over time is little known in orthopedics! Thanks for the great Paper!**

Thank you. It's perhaps still a bit controversial in the lung field, but I think the 2012 Narayanan paper (DOI 10.1164/rccm.201107-1348OC) is pretty compelling.

**18. Great study Dr. Varisco! Did you try to correlate the size of the lungs on both side of the spine depending on the proximity to the apex? Do you think this may be relevant in terms of loading asymmetry on the concavity/convexity of the spine curvature?**

No, but that's a good idea. I think you may be talking about alveolar size and not lung size. We looked at total lung volumes but did not look at any of the linear dimensions. Similarly, we didn't quantify at any gradients of alveolar size although it did appear that apex ADC was slightly larger than base ADC in both control and AIS which is consistent with normal lung physiology. Given that our only significant alveolar size-related finding was increased alveolar density in convex lung post-PSF, I suspect that we'd see a greater size reduction in the apex compared to the base in those lungs.