

Draft Program for Human and Automated annotation of degenerative changes in the lumbar spine ISSLS Special Interest Group 0900-1200 Tuesday 2nd May 2023, Melbourne Australia
Jeremy Fairbank

Objectives

Annotation of asymptomatic groups and cohorts by age and spinal level

Hypotheses:

1. This reflects 'normal' age related disc degeneration
2. Variation may be due to genetic/ethnic and environmental factors
3. If we use a single ML based annotation system (eg SpineNet/Esparanto) on all available material, we should be able to make direct comparisons of degenerative features
4. We can compare various local Human annotations directly with SpineNet and thus indirectly between each other

Annotation of symptomatic groups and cohorts by age and spinal level

Hypotheses:

1. Early onset Disc degeneration is associated with symptoms
2. Accelerated age- related disc degeneration is associated with symptoms
3. Variant Disc degeneration is related to symptoms
4. If we use a single ML annotation system (eg SpineNet/'Esparanto') on all available material we should be able to make direct comparisons of degenerative features
5. There may be variation on the influence of disc degeneration on symptoms between different clinical cohorts (e.g. population data; primary care derived data; secondary care derived data; tertiary care derived data?)
6. It is likely that the different available annotation systems vary in their capacity to distinguish different sorts of disc degeneration
7. We can make an ML version of any Human Annotation system

Draft Agenda

1. Introduction – Jeremy Fairbank
2. Presentation and discussion of SpineNet comparison of degenerative features (T2sag MRI) by age and spinal level between an asymptomatic population cohort and 2 symptomatic cohorts from secondary care (J Fairbank and Amir Jamaludin) (10 mins presentation, 15 mins discussion)
3. Presentation and discussion of comparison of degenerative features (MRI and T1rho) by age and spinal level between an asymptomatic cohort and a symptomatic cohort from secondary care (Jeff Lotz's Group) (10 mins presentation, 15 mins discussion)
4. Presentation and discussion of comparison of degenerative features (MRI) by age and spinal level within the Wakayama population cohort an asymptomatic cohort and a symptomatic cohort from secondary care (Hiroshi Hashizume and Yuyu Ishimoto) (10 mins presentation, 15 mins discussion)
5. Presentation and discussion of comparison of degenerative features (MRI) by age and spinal level within various Danish cohorts (Tue Secher Jensen) (10 mins presentation, 15 mins discussion)

6. Presentation and discussion of comparison of degenerative features (MRI) by age and spinal level within various Finnish cohorts (Terence McSweeney) (10 mins presentation, 15 mins discussion)
7. Summary of work from Ganga Hospital Group on biomarkers for symptomatic disc degeneration Rajasekaran Shanmuganathan (10 mins presentation, 15 mins discussion)
8. JF to present summary of Greifswald cohort and publication in Spine (10 mins presentation, 15 mins discussion)
9. General discussion to develop a research plan to address the hypotheses above.
10. Wrap up 1200

- **This flyer is to invite others who are interested to attend.**
- **I can add other presentations with relevant data, if the presenter could get in touch with me first**

Jeremy Fairbank - jeremyfairbank@gmail.com