ICOS / Braining.app - a new method for early dementia detection

Introduction

Early dementia detection is still a problem in everydays clinical practice - for general practioners as well as for neurologists. With respect to the current covid-19-pandemia this problem has even aggravated recently as most of the patients, that are to be considered for early dementia detection, are (age-based) at risk to suffer major medical complications from a covid-19-infection - hence social interactions should be reduced as good as possible.

For this reason an internet based method for early dementia detection which goes by the acronym ICOS (Internet based COgnitiv Score) was developed, that allows fast, easy and sensitive relevant testing on that matter - from home. The test is provided as a so called PWA (=progressive web app), that can be done – preferably on your own mobile phone – at the url https://braining.app.

The test takes about 5-10 minutes and returns an age- and education-adjusted score - the so called ICOS - that reflects indications about signs for early dementia. The backbone for that process is a complex interaction of artificial intelligence, several algorithms and subroutines.

Major advantages of ICOS could be the possibility to track individual real executive time precisely (even more in temporal sequence) and do more complex and dynamic weightings than traditional analogue tests can do.

Method

A single center study comparing the ICOS Score results to Mini Mental Score Examination results and DemTect Score results of corresponding patients had been done by a specialist for neurology in order to validate the App/Test. The comparison included healthy patients as well as patients that already got diagnosed (early) dementia and compares cut offs and derived information from each method, calculating sensitivity and specificity.

ICOS was done in that comparison study in a doctor's office under observation but without providing any help in order to simulate a realistic usage at home.

Results

It is to be anticipated that the number of the investigated patients in this comparison test is yet too little to provide good statistical power, which is simply caused by this method being avaible only since a short time. In this context it should be mentioned, that a bigger multi centered double blinded study is in schedule.

With these limitations in mind still the numbers show that ICOS has a significant bigger sensitivity on detecting early dementia than the Mini Mental Scale Examination and ICOS has a slightly bigger sensitivity on detecting early dementia than the DemTect, whereas there is a slightly worse specificity for DemTect and ICOS versus Mini Mental Scale Examination.

The patient cohort included 39 persons aged between 31 and 87 years, whereas 22 out of these were diagnosed dementia already and 17 were diagnosed healthy.

The Mini Mental Scale Examination detected 16 out of the 22 known persons with diagnosed dementia, giving no false positive result on healthy people.

The DemTect detected 21 out of the 22 known persons with diagnosed dementia, giving 2 false positive results on the healthy people.

The ICOS detected 22 out of the 22 known persons with diagnosed dementia, giving 2 false positive results on the healy people.

Conclusion

Even tough more scientific data on the ICOS needs to be aquired yet, the data available by now indicates, that it could be a good option for early dementia detection in future, making it an easy and safe method for testing from home as a screening test (with subsequent visit to the doctor´s office).

Taking that into consideration it could be an option to increase medical efficiency and numbers of detected early dementias.

Outlook to the future

Based on its technology ICOS will most likely become more sensitive in the future due to its option to create an own account, safe ones personal test data and compare ones personal test data in temporal sequence. As the method is too young there doesn´t exist any scientific data in this regard yet.

Currently in alpha release state is a derived technology that would create individual exercises for patients derived from their personal ICOS results in order to prevent/slow down dementia by using the same artificial intelligence technology as ICOS does.

While doing that comparison it was noticeable that ICOS as well as DemTect can´t be done by patients with moderate to severe dementia, as the tasks are too complex. In order to solve that problem a modification of ICOS is currently in development, that would integrate a software switch, which would switch to an easier testing procedure if indications for a more severe dementia are detected while testing.

Access data for the test / App

https://braining.app

Contact Data

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