NEUROANATOMICAL AND NEUROCOGNITIVE PREDICTORS OF POST-OPERATIVE COGNITIVE DYSFUNCTION IN NON-DEMENTED OLDER ADULTS

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Introduction

Previous research studies report high incidence of cognitive changes following cardiac surgery. There is, however, little known about the effects of other major non-cardiac surgeries on neurocognitive post-operative function. Recent clinical studies show that post-operative changes are most common among adults over the age of 60 who undergo major orthopedic surgery [1].

The purpose of the present investigation is to identify neuroanatomical predictors of postoperative cognitive dysfunction in non-demented patients over the age of 60 who are having major orthopedic surgery. The project is based on the hypothesis that pre-existing neuroanatomical markers as seen on pre-operative MRI studies will predict the development of post-operative cognitive dysfunction. Pre-existing markers of interest include: reduced hippocampal/ entorhinal cortex volumes, degree of ischemic white matter disease, brain volume, integrity of white matter tracts and presence of infarctions at different ages.

Experimental

The pre-existing markers of interest are determined pre-operatively via MRI studies using the McKnight Brain Institute Siemens 3T Allegra head scanner equipped with gradients capable of 40mT/m. Volumetrics are obtaining using Turboflash MP Rage sequences (TR=2500ms, TE=4msec, FA=8 degrees, FOV=230 mm, Slice thickness – 1mm, Gap=0%) that are reconstructed into a series of 160 contiguous images in the sagittal plane. FLAIR images (Tr=8500msec, TE=99msec, FA=180, FOV=200mm, Slice thickness = 5mm) and DWI (TR=3300msec, TE=78 msec, FA=90, FOV=230, Slice thickness = 5mm) to examine pre-existing vascular burden. Contiguous 3mm coronal and axial slices are obtained through the MTL and supratentorial structures, respectively, with 6-direction diffusion tensor image sets.

Results and Discussion

To date, 62 of the planned 80 participants have been recruited. Of these 62 patients, 42 have completed all MRI sequences. The remaining patients were either too large to fit in the scanner or complained of claustrophobia. Analyses of the volumetric and FLAIR images with cognitive measures are still being conducted. Raw DTI images are still being processed.

Conclusions

None to report since the data are still being processed and analyzed.

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References