Pathological aging brains contain the same amyloid plaques as Alzheimer's disease

23 May 2012

Pathological aging (PA) is used to describe the brains of people which have Alzheimer's disease (AD)-like pathology but where the person showed no signs of cognitive impairment whilst they were alive. New research, published in BioMed Central's open access journal *Alzheimer's Research & Therapy*, shows that PA and AD brains contain similar amyloid ? (A?) plaques and that while on average AD brains contain more A? there was considerable overlap in A? subtypes. These results suggest that PA may simply be an early stage of AD.

AD is the most common cause of dementia. It can result in loss of memory, mood changes, and cause problems with communication and reasoning. The disease is characterized by large numbers of Ab; plaques, tangles and neuroinflammation changes within the brain. People with PA also have Ab; plaques, but less neuroinflammation and other AD specific brain changes, so it has been previously suggested that the Ab; plaques in PA are different and somehow less toxic than those in AD.

Researchers from University of Florida and Mayo Clinic, supported by the National Institute of Health, compared post-mortem brain tissue from people with AD, PA, and controls. When they looked at the type and amount of Ab; they found that while both AD and PA had elevated levels of Ab; on average levels were slightly lower in PA.

Comparing subtypes of Ab demonstrated that there was a great deal of similarity and overlap between AD and PA and biochemical analysis showed both AD and PA have dramatically, but equivalent, higher levels of insoluble Ab, compared to controls. Further studies showed that that there were really no major differences between the accumulated Ab in both AD and PA.

Dr Todd Golde, who coordinated the research, commented, "We found a high degree of overlap in Ab levels, profiles, and solubility, between the brains of people with PA and AD. While there might be some subtle differences in Ab, it seems that PA may represent an early stage of AD rather than a benign form of Ab deposition, and that if they live long enough people with PA will go on to develop AD. We hope that understanding the differences between PA and AD will provide new ways to help protect the brain and promote the development of AD therapeutics."

More information: Overlapping profiles of abeta peptides in the Alzheimer's disease and pathological aging brains Brenda D Moore, Paramita Chakrabarty, Yona Levites, Tom L Kukar, Ann-Marie Baine, Tina Moroni, Thomas B Ladd, Pritam Das, Dennis W Dickson and Todd E Golde *Alzheimer's Research & Therapy* (in press)

Provided by BioMed Central