



# STRESS & DEMENTIA

1

Exploring Distress and Distress Prone Personality  
As A Risk Factor For Dementia

Amanda Berg, June 23, 2010

# OUTLINE

- Risk Factors For Dementia
- Personality types as a marker for chronic stress
- Research
  - Personality as a Risk Factor for Dementia
  - Distress as a Risk Factor for Dementia
- Theories on Pathophysiology
- Implications for clinical practice

# MODIFIABLE MIDLIFE RISK FACTORS FOR LATE-LIFE DEMENTIA

- Education, complex occupation
- Blood Pressure, Cholesterol, Diabetes Mellitus, Obesity, smoking cessation.
- Head Injury
- Depression
- Physical Activity, Cognitive Activity Social Activity
- Light to moderate alcohol consumption
- Avoid post-menopausal reproductive hormone therapy
- **Personality**

# PERSONALITY

- Aspects include
  - How people tend to think of themselves
  - How they relate to people
  - How they interpret and deal with events in the environment
  - How they react emotionally to a situation.
- Personality Disorder vs. Personality Traits.
- **extraversion, neuroticism, agreeableness, openness, conscientiousness.**

# NEUROTICISM

- Tendency to experience negative emotions
  - Anger, anxiety, guilt, depressed mood
- Those who score high tend to be
  - Sensitive/Nervous as opposed to secure/confident
  - emotionally reactive
  - vulnerable to stress
- Associated with lower effectiveness in managing stress

# CONSCIENTIOUSNESS

- Trait of being:
  - careful,
  - self disciplined
  - thorough, organized,
  - think carefully before acting
  - need for achievement.
  - Efficient/organized as opposed to easy going/careless

# EXTROVERSION

- Characterized by
  - Positive emotions
  - Tendency to seek out stimulation
  - Tendency to seek out company of others
  - Energetic/outgoing as opposed to shy/reserved

# PERSONALITY TRAITS & LONGEVITY

## ○ The Nun Study

- Positive Emotions in Early Life and Longevity
- Handwritten autobiographies 180 nuns
- Positive emotional content –step wise decrease in risk of mortality.

# DO PERSONALITY TRAITS PREDICT THE OCCURRENCE OF ALZHEIMER'S DISEASE

- 56 probable Alzheimer's Disease & 65 controls with Parkinson's Disease.
- Pre-morbid personality traits were assessed using a standardized personality test completed by a close relative
- Reference time frame 3 years prior to dementia or EPS
- **Patients with AD had significantly higher neuroticism**
- The patients did not differ from the controls in frustration tolerance, extraversion or rigidity

# PERSONALITY AND RISK OF COGNITIVE IMPAIRMENT 25 YEARS LATER

- 4039 subjects in the Swedish Twin Registry
  - Neuroticism and extroversion scores were collected in 1973 at midlife
  - Cognitive impairment was assessed in the same group 25 years later
- 1) Greater neuroticism was associated with higher risk of cognitive impairment controlling for age, gender and level of education, smoking, and alcohol use
  - 2) Moderate extraversion and decreased risk of cognitive impairment
  - 3) High neuroticism/low extraversion conferred significant high risk

# CHRONIC DISTRESS AND INCIDENCE OF MILD COGNITIVE IMPAIRMENT

- Participants in the Religious Orders Study
- N=1256 without cognitive impairment at baseline
- Completed 6 item measure of neuroticism
  - indicator of tendency to experience psychological stress
- During 12 year follow up 38% developed MCI
- Risk of MCI increased by about 2% for each one point in increase on the distress scale
- Overall, a person scoring in the 90<sup>th</sup> percentile 42% more likely to develop MCI than someone in the 10<sup>th</sup> percentile.

# CHRONIC DISTRESS AND INCIDENCE OF MILD COGNITIVE IMPAIRMENT

- Adjustment for depression symptoms did not affect the risk.
- Depressive symptoms were also related to risk of MCI but not after controlling for distress score.

# CHRONIC DISTRESS, AGE-RELATED NEUROPATHOLOGY AND LATE-LIFE DEMENTIA

- ?common neuropathology accounting for relation of chronic distress and dementia
- 210 autopsies.
- Levels of amyloid-beta and tau-positive neurofibrillary tangles and lewy bodies were quantified.
- Higher level of chronic distress was associated with higher likelihood of dementia and lower level of cognition proximate to death.
- Chronic distress was not correlated with any form of neuropathology, including limbic, neocortical and global indices
- Novel neuro-deteriorative mechanism may be involved

# CONSCIENTIOUSNESS AND THE INCIDENCE OF ALZHEIMER DISEASE AND MILD COGNITIVE IMPAIRMENT

- 997 older catholic nuns, priests and brothers
- 12 year follow-up
- 176 people developed Alzheimer's Disease
- Conscientiousness had been assessed at baseline
- Hazard of AD decreased by more than 5% for each additional point on the conscientiousness scale
- Also associated with decreased incidence of mild cognitive impairment and reduced cognitive decline
- Conscientiousness was unrelated to neuropathology measures

# MIDLIFE NEUROTICISM AND THE AGE OF ONSET OF ALZHEIMER'S DISEASE

- Case comparison study of 213 patients with probable AD.
- Age of onset and retrospective Personality Inventory by two knowledgeable informants.
- Midline neuroticism predicted younger age of dementia onset in females but not males
- Was equivalent to a difference of almost 2 years in age of onset across the quartiles for Neuroticism.

# MIDLIFE PSYCHOLOGICAL STRESS AND RISK OF DEMENTIA: A 35 YEAR POPULATION STUDY

- Prospective Population Study of Women in Gothenburg
- 1462 females aged 38-60 were assessed for psychological distressed with a standardized question
  - 1968, 1974, 1980
- During 35 year follow-up 161 developed dementia
- Risk of dementia was increased in females reporting frequent/constant stress
- Reporting stress at one, two or three examinations was related to a sequentially higher dementia risk. HR (1.10, 1.73, 2.51)

*Brain* (May 2010) Johansson et. al.

# WHAT IS THE MECHANISM.

- Chronic psychological stress
  - ?neurodegenerative effect.
  - ?Overactivation of hypothalamic-pituitary-adrenal axis and sympathetic nervous system
  - ?overproduction of cortisol,
  - ?Structural and functional damage to the hippocampus
  - ?pro inflammatory cytokines
  - ? Brain volume - reduced cerebral reserve
- Experience of stress as an early symptom, in the pre-clinical stage
- Vulnerability to stress may be both a cause and a consequence of lifestyle factors which may mediate the association

# IMPLICATIONS FOR PRACTICE

- Interesting research but difficult to apply when assessing patients for dementia
- No suggestion that the increased distress measured in the study correlates to Personality Disorder that psychiatrists might treat.
- Personality is not easily “modifiable” in the first place
- Part of a greater trend in research looking at health implications of chronic stress.
  - Overall may lead to more research in detecting and managing chronic stress and understanding the pathophysiology of chronic stress related health complications

# SUMMARY

- Multiple studies suggest an association between neuroticism score and risk for dementia
- Less robust evidence conscientiousness as a protective factor for dementia does exist.
- No neuropathological correlation has been found
- Multiple theories regarding the pathophysiology of the association.
- Part of an emerging area of research.

