Depression After Stroke

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Depression After Stroke
33% (29-79%)
Hackett et al. 2004

Major Depression 19%
Minor Depression 19%
(Robinson 2000)
Significance of Depression After Stroke

- Increased mortality
  (William et al. 2004)
- Increased morbidity
- Increased hospital stay
- Reduced quality of life
  (Hadidi et al. 2009)
In stroke patients Depression also associated with:

- Increased cognitive impairment  
  (Kauhanen et al. 1999)
- Increased falls  
  (Jorgensen et al. 2002)
- Inability to return to work  
  (Neare et al. 1998)
- Worse rehabilitation outcome  
  (Gillen et al. 2001)
Post stroke depression are 3.4 times more likely to die within 10 years of stroke. Data emerge most clearly in 2-5 year interval.

(Bartoli et al. 2013)
Diagnosis of depression after stroke is complicated by stroke deficits of fatigue, appetite, and sleep changes. In addition aphasia, anosognosia and cognitive consequences of stroke alter the diagnostic process.
Three Mood Disorders seen in Stroke Patients:

• **Major Depression**
  - Sadness, anxiety, loss of interest, sleep and appetite impairment, concentration and thinking impairment, thoughts of death or suicide.

• **Minor (Dysthymic) Depression**
  - Similar symptoms to major depression but less intense

• **Apathy**
  - Diminished goal directed behavior, emotion, cognition may occur with or without depression. Major depression associated with apathy. Significantly associated with lesions in posterior limb of the internal capsule (Starkstein et al. 1993) and reduced frontal lobe activity (Okada et al. 1997)
Location and Timing

- Although early studies indicated that left-sided, anterior lesions were more likely to produce depression, this association has been equivocal in later studies.

- Depression may develop between 3 months and 2 years post stroke even as initial disability improves, possibly related to physiologic reorganization:
  - 3 months: 25%
  - 12 months: 16%
  - 24 months: 19%
  - 36 months: 30%

(Astrom et al. 1993)
Risk Factors for PSD

- Prior depression
- Stroke severity
- Cognitive Impairment
- Poor Functional outcome
Psychological Mechanism

- Psychosocial, stress models
- Major life events as risk factors
- Neurotic personality style
- Disability response
- Social isolation
Biological Mechanisms

- Inflammatory cascade
- Reorganization of cortex
- Altered neuroplasticity and neurogenesis
- Endothelial dysfunction
Interactive Mechanism

Vascular Depression- Chronic ischemic damage is an important cause of depression in the elderly. Late onset depression has higher rates of enaphalomalaica and hyperintensities on MRI, compared with younger depressed patients (Hickit et al. 1995). Also described as subcortical ischemic depression (Taylor et al. 2006).
PSD data are paralleled by post myocaridal infarction depression. Depressive symptoms occur in 40% of patients, with major depression occurring in 20-25%. A four fold increase in death rate has been reported, compared to controls.

(Frazure-Smith et al. 1993)
Major depression is associated with changes in platelet biomarkers:

- Reduction of serotonin transporter binding sites
- Changes in serotonin 5HT$_2$ receptor binding on platelet surfaces
- Elevated monoamine oxidase
- Increased platelet activity mediated by elevated platelet factor 4 and ß-thromboglobulin
Similar to cardiac illness, depression has been associated with increased stroke risk. Everson et al. (1998) followed a sample of 6700 stroke-free adults (avg. age 43) for 49 years. Those reporting 5 or more depressive symptoms (15% of sample) experienced more than 50% excess risk of death.
Non-Pharmacologic Treatments
Psychosocial Interventions:

• Information
• Activation
• Telephone based monitoring
• Psychotherapy
• Exercise
• rTMS, ECT
Pharmacologic Treatment:

Methodologic problems confound evidence based assessment. However a clear efficacy signal has been preset in most studies

- Nortriptyline > Fluoxetine

  (Robinson et al. 2000)

- Stimulants
Antidepressant Agents

In a meta-analysis of 52 trials of SSRIs, there was evidence statistically significant benefits both on neurological deficits, depression and anxiety.

(Mead et al. 2012)
Meta-Analysis of 16 Randomized Trials

- SSRI, Tricyclic, Others 65%
- Placebo 44%

Effects became significant at 3-4 weeks and increased with continued treatment. Recommended treatment duration: 8 weeks, and even 6 months.
• In a meta-analysis of depression prevention in post-stroke patients, antidepressants reduced depression to 12.5% compared to 29% in control group.

(Chen et al. 2007)

• Antidepressants have also been reported to reduce stroke mortality. A nine year follow-up study by Jorge et al. (2005) reported that both fluoxetine and nortriptyline for 3 months improved survival in depressed and non-depressed patients.
Are Antidepressants Neuroprotective?

Studies have suggested antidepressants may improve stroke outcome, although the mechanism is unclear. Animal studies point to protection of hippocampal neurons stimulation of neurogenesis, induction of growth factors, and other serotonin-mediated factors.
Conclusion

Depression following a stroke is a common occurrence, and it is generally undertreated. Depression has negative effects on rehabilitation, mortality, and quality of life. Antidepressant agents appear to be helpful and some positive effects may be independent of their effects on depression. The brain’s response to stroke is complex and incompletely understood.
Q & A