

Who Does Well After Stroke?

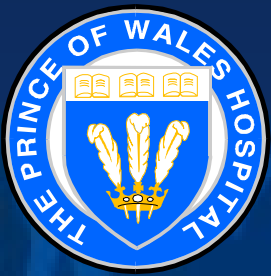
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Desmond et al (1996)

- **151 stroke patients**
- **Interviewed at 3-mths and at 12 to 36-mths post-stroke**
- **Improvement = more than 2SDs above change in control group scores (n=19)**
- **Improvers**
 - **more likely to have a left hemispheric infarct vs brain stem/cerebellar infarct**
 - **lower incidence of diabetes**
 - **more impaired cognitive summary score at baseline**

Ballard et al (2003)

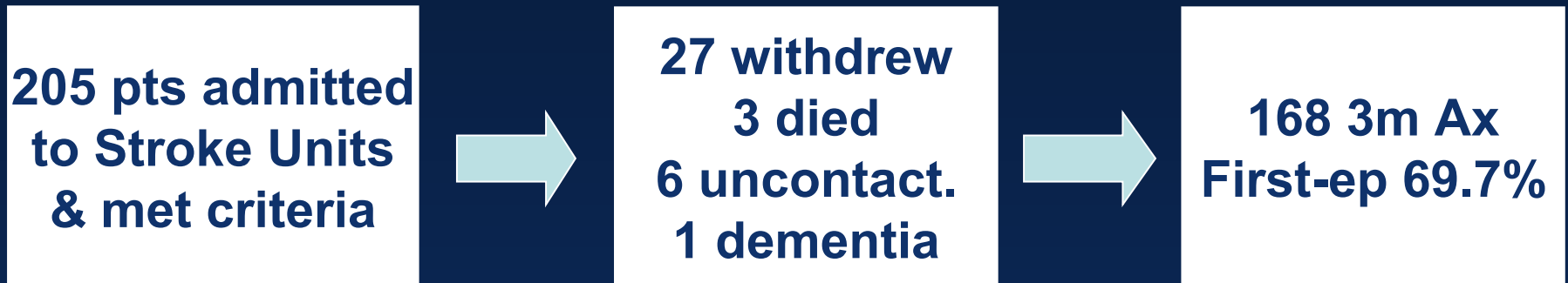
- **115 stroke patients (80.4 \pm 3.8 yrs)**
- **Tested at 3-mths & at 15-mths post-stroke**
- **Improvement = greater than 2 point increase in Mini-Mental State Examination score (n=18)**
- **Decliners = diagnosis of dementia (n=10)**
- **Improvers versus stable group**
 - **significant lower attention, orientation and total cognition scores on CAMCOG**
 - **diabetes = significantly less likely to be an improver**

Aims

- Previous studies have only examined those in highest echelon of improvement and improvement has been defined cognitively
- People who are performing ‘at ceiling’ have not been examined
- Hence ours is a study of ‘*doing well*’ following stroke

Study Design

Stroke Group



Control Group



Defining “Doing Well”

- **Cognitively & functionally**
- **‘Doing well’ = MMSE score of $\geq 28/30$ and a combined ADL/IADL score of $\geq 11/14$ at one-year follow-up**
- **Study sample = 96 patients & 75 controls with complete MMSE, ADL and IADL scale scores at both time points**
- **3 groups: ‘doing well’, ‘not doing well’ and mixed**

Sydney Stroke Study

Longitudinal study including:

- **Clinical and psychiatric assessments**
 - **SCID interview: DSM-IV Dx**
 - **Hamilton Depression Rating Scale (HDRS-17) (cut 10/11)**
 - **Geriatric Depression Scale (GDS-15) (cut 5/6)**
 - **Apathy Evaluation Scale (AES, Marin, 1991) (cut 36/37)**
 - **Neuropsychiatric Inventory (NPI)**
- **Neuropsychological testing**
- **Neuroimaging (MRI)**

Demographic & Clinical Variables

	Doing Well n=53	Not Doing Well n=19
Age	69.4 (8.3)	70.6 (10.6)**
Gender (%m)	56.6	55.8
Yrs Educ	10.5 (2.8)	9.5 (1.8)
NART-R IQ	108.2 (8.8)	101.4 (8.4)**
MMSE	28.7 (1.7)	27.3 (2.1)***
ADL+IADL	13.6 (0.8)	9.2 (4.0)***
HDRS-17	3.6 (4.9)	2.4 (3.0)

*p≤0.05; **p≤0.01; ***p≤0.001

Stroke Variables

	Doing Well n=53	Not Doing Well n=19
ESS	91.7 (12.0)	90.3 (11.2)
No. infarcts	1.2 (1.2)	1.0 (1.3)
Total vol infarction (mm³)	610.0 (830.4)	509.4 (829.3)
Left-sided infarction (%)	44.2	44.4
Right-sided infarction (%)	51.9	44.4
Interim stroke/TIA	8.0	33.3*

*p<0.05; **p<0.01; ***p<0.001

Cardiovascular Risk Factors

(%)	Doing Well n=53	Not Doing Well n=19
Hypertension	62.3	77.8
Diabetes	11.3	33.3*
Hypercholesterolemia	38.0	43.8
Coronary Artery Disease	28.8	11.8
Atrial fibrillation	19.6	44.4*
Smoking	72.9	68.4
Alcohol abuse	1.9	22.2*

In Addition

Those doing well:

- Were more likely to be married at initial assessment (OR=3.71, 95% CI 1.12, 12.30)
- Had less apathy (OR=0.87, 95% CI 0.79, 0.96) but not less depression (DSM major and/or minor; OR=4.58, 95% CI 0.28, 75.18)
- Had less dementia (OR=0.05, 95% CI 0.007, 0.39)
- And less brain atrophy on MRI (subset of 36 patients; OR=0.45, 95% CI 0.21, 0.95)

Detrimental Factors

Apathy is linked to poorer outcomes

- has a biological origin i.e. is not laziness**
- people with motivational problems are less likely to seek rehabilitation services**
- moderating variable or proxy for atrophy?**

Protective Factors

Does more brain reserve help?

- higher premorbid IQ = better outcome
- BUT no r'ship with yrs of education
- consistent with lack of direct r'ship b/w brain pathology and clinical outcomes

Marriage?

- equal effect for both genders
- benefits of increased support

Methodological Issues

- Relatively large sample and broad range of assessments
- Those performing at ceiling were also included
- Outcomes considered functionally & cognitively
- First & repeat stroke patients included but no sig differences on stroke variables
- Limited subject numbers in MRI sub-study
- More patients doing poorly may have dropped out of the study however their 3-month parameters were similar to those who continued

In Conclusion

People tend to have relatively good outcomes following stroke except in the presence of small vessel disease and/or further cerebrovascular events

Using the 3- and 5-year data, we will be able to determine whether this improvement continues over longer periods of time

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