



How common is death by suicide after stroke? A national registry study

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Background

- The Sentinel Stroke National Audit Programme (SSNAP) is the national stroke care register in **England, Wales and Northern Ireland**.
- Previous studies show high rates of post-stroke suicide [Eriksson 2015, Neurology], [Pompili 2012, CNS Neuroscience & therapeutics] especially in men and younger stroke survivors. We looked at post-stroke suicide deaths in England and Wales.

Methods

- Data on **220,680** adults discharged from hospital between April 2013 and March 2016 were extracted from SSNAP.
- Suicide deaths were identified by linkage with Office of National Statistics death registrations (ICD-10:X60-X84, Y10-Y34).
- Age adjusted post-stroke suicide rates were compared to the general UK population.
- Time from stroke onset to death by suicide was analysed by **Cox regression**.

Results

- During 293,925 person-years of follow-up, 114 deaths by suicide occurred during the follow-up period.
- The median time from stroke onset to death by suicide was 127 days (IQR 41-358).
- The group that died by suicide after stroke were **younger** than the rest of the stroke population, the median age was two years younger (75 years vs 77 years, Kruskal–Wallis test $p=0.001$). A **higher percentage** were male (72.8% vs 49.9%, $p<0.001$).
- The age-sex standardised suicide rate in people with stroke aged over 30 was **56.5 per 100,000 population per year** compared to **10.8 per 100,000 population per year** in the general UK population. The relative rate of suicide in the stroke population is 5.2 times higher than in the general population.
- In univariable Cox regressions (model 1-4) older age is associated with a lower risk of death by suicide, whereas being male, stroke type being intracerebral haemorrhage (ICH), or stroke severity (measured by the level of consciousness (LOC) at arrival at hospital after stroke) were associated with a higher risk of death by suicide.
- After adjustment, the association between age and risk of death by suicide is no longer significant when controlling for sex (model 5). In the final model (model 8) that includes sex, age, stroke type and stroke severity, being male significantly increases the risk of death by suicide, and so does having had a more severe stroke. There is no significant relationship between age or stroke type being ICH in the full model.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Male	2.47 [2.06; 2.89]*				2.36 [1.94; 2.78]*	2.36 [1.94; 2.77]*	2.49 [2.07; 2.91]*	2.48 [2.06; 2.90]*
Age (years)		0.99 [0.97; 1.00]*			0.99 [0.98; 1.00]	0.99 [0.98; 1.00]	0.99 [0.98; 1.00]	0.99 [0.98; 1.00]
ICH			1.79 [1.28; 2.31]*			1.77 [1.26; 2.29]*		1.46 [0.93; 1.99]
Level of consciousness				Reference			Reference	Reference
0								
1				1.78 [1.18; 2.38]*			2.00 [1.39; 2.60]*	1.91 [1.31; 2.52]*
2				3.66 [2.89; 4.43]*			4.25 [3.47; 5.02]*	3.98 [3.20; 4.76]*
3				7.12 [6.21; 8.02]*			7.74 [6.84; 8.65]*	7.09 [6.18; 8.01]*

* p-value less than 0.05

Conclusion

- Our large, long-term record linkage study suggests a higher risk of death by suicide among people with stroke than in the general population.
- Male sex and more severe stroke are associated with a higher risk of death by suicide. This is consistent with previous research.
- In many studies older age is associated with lower risk of death by suicide. In this study the association between older age and lower risk of death by suicide was no longer significant after adjusting for sex.
- Depression screening at various points after stroke is recommended in national guidelines and may reduce the risk of suicide through appropriate detection and treatment.