AGE-SPECIFIC STROKE PROFILES AND OUTCOMES IN WOMEN

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INTRODUCTION

Stroke disproportionately impacts women, primarily due to their longevity; women account for 60% of stroke deaths (1). Functional outcome and quality of life (QoL) after stroke are consistently poorer in women (2). Additionally, between 5-20%(3-5) of first strokes occur in people aged younger than 49 years, yet studies of sex differences in stroke outcomes have predominantly included those aged over 45 years (6-9). Limited data exist on younger women, yet these data are particularly important as stroke incidence is increasing in this population (10). We aimed to explore sex differences in index stroke severity and functional outcomes, and the factors associated with poorer functional outcomes in women.

METHODS

We analysed anonymised data from registry-based populations within the Virtual International Stroke Trials Archive (VISTA). Generalised linear modelling described relationships among demography, clinical factors, and functional outcome (modified Rankin Scale [mRS]) at 1 year, by sex and age at onset (18-45 years, 46-55 years, 56-75 years, and >75 years). For women, we described whether baseline variables were specific-effect-modifiers of age, and the factors that were associated with poorer mRS at 1 year, within each age stratum.

RESULTS

In 6,632 patients (median age=70, Interquartile Range [60,78]; n=3,001 [45.3%] female), after adjusting for age, presence of atrial fibrillation (AF), hypertension, diabetes, prior stroke, pre-stroke independence, hemisphere affected, and type of stroke, we observed no sex differences in initial stroke severity by National Institutes of Health Stroke Scale (NIHSS; p=0.27; Table 1).

Table 1: Analysis of between-sex differences in baseline NIHSS, stratified by age category (modelling trend towards milder index stroke)

Stratum	Age 18-45 years				Age 46-55 Years				Age 56-75 years				Age >75 years			
	Odds Ratio Estimates				Odds Ratio Estimates				Odds Ratio Estimates				Odds Ratio Estimates			
Effect	Pr > ChiSq	Point Estimate	95% Wald Confidence Limits		Pr > ChiSq	Point Estimate	95% Wald Confidence Limits		Pr > ChiSq	Point Estimate	95% Wald Confidence Limits		Pr > ChiSq	Point Estimate	95% Wald Confidence Limits	
Female vs Male	0.1792	0.740	0.478	1.148	0.9224	1.018	0.710	1.459	0.8743	1.013	0.864	1.188	0.6011	0.944	0.762	1.170

Table 2: Analysis of between-sex differences in mRS at 1 year, stratified by age category (modelling a trend towards poorer mRS)

Stratum	18-45 Years				46-55 years				56-75 years				>75 years			
	Odds Ratio Estimates				Odds Ratio Estimates				Odds Ratio Estimates				Odds Ratio Estimates			
Effect	Pr > Chi Sq	Point Estimate	95% Wald Confidence Limits		Pr > ChiSq	Point Estimate	95% Wald Confidence Limits		Pr > ChiSq	Point Estimate	95% Wald Confidence Limits		Pr > ChiSq	Point Estimate	95% Wald Confidence Limits	
Female vs Male	0.2153	0.691	0.386	1.240	0.2732	1.277	0.825	1.976	0.0090	1.279	1.063	1.538	0.0685	1.298	0.980	1.718

Table 3: Factors associated with a trend towards poorer mRS at 1 year post-stroke, in women of different ages

	18-45 years (n=188)		46-55 years (n=230)		56-75 years (n=1265)		>75 Years (n=1316)	
Effect	Pr > ChiSq	OR [95% CI]	Pr > ChiSq	OR [95% CI]	Pr > ChiSq	OR [95% CI]	Pr > ChiSq	OR [95% CI]
Age	0.6942	1.0 [0.9, 1.1]	0.0105	-	<.0001	1.1 [1.0, 1.1]	0.0002	1.1 [1.0,1.1]
Baseline NIHSS score	<.0001	1.2 [1.1, 1.3]	<.0001	1.2 [1.2, 1.3]	<.0001	1.2 [1.2, 1.3]	<.0001	1.2 [1.1,1.2]
Prior mRS	0.9127	1.0 [0.5, 2.2]	0.0701	-	0.0001	1.5 [1.2, 1.9]	<.0001	1.7 [1.4, 1.9]
Atrial Fibrillation Presence vs Absence	-	-	0.7639	0.8 [0.2, 3.9]	0.5280	0.9 [0.6, 1.3]	0.0086	1.6 [1.1, 2.3]
Hypertension Presence vs Absence	0.7984	0.8 [0.2, 3.3]	0.0002	5.1 [2.2, 12.0]	0.8791	1.0 [0.7, 1.4]	0.3932	1.2 [0.8, 1.9]
Diabetes Presence vs Absence	0.0810	5.3 [0.8, 35.2]	0.4488	1.6 [0.5, 5.5]	0.0141	1.5 [1.1, 2.2]	0.1164	1.4 [0.9, 2.0]
Prior Stroke Presence vs Absence	0.0119	14.1 [1.8, 110.7]	0.3302	0.5 [0.1, 2.1]	0.1802	1.3 [0.9, 2.0]	0.5984	1.1 [0.7, 1.7]
Hemisphere Left vs Right	0.8110	0.9 [0.4, 2.2]	0.5614	0.8 [0.4, 1.7]	0.0002	0.6 [0.4, 0.8]	0.2531	0.8 [0.6, 1.2]
Thrombolysed vs non thrombolysed	0.0679	3.8 [0.9, 16.3]	0.0689	0.3 [0.1, 1.1]	0.5786	1.2 [0.7, 2.0]	0.8503	0.9 [0.4, 2.1]
Stroke Type Ischaemic vs ICH	-	-	-	-	0.4259	0.6 [0.1, 2.3]	-	-
Age* Prior mRS	-	-	0.0523	-	-	-	-	-

Women aged between 56-75 years had poorer mRS scores at 1 year when compared with men aged 56-75 years after adjusting for covariates (Table 2).

In women, AF in those aged >75 years; hypertension in those aged 46-55 years and diabetes in those aged 56-75 years were each associated with increased odds of poor mRS at 1 year, but were not significant in any other age stratum (Table 3).

Discussion

In this registry based stroke population, we observed no sex differences in index stroke severity. Sex differences in functional outcomes at 1 year were present only in those aged 56-75 years.

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