

Stroke by gender

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Disclosure

No conflicts of interest

objectives

- Incidence, classification and case fatality rate by gender
- Specific syndromes in pregnancy and puerperium
- Presentation of cases

Incidence rate of stroke by gender in Chile

	Men		Women		Total population	
	Number of cases/ number at risk	Incidence rate (95% CI)	Number of cases/ number at risk	Incidence rate (95% CI)	Number of cases/ number at risk	Incidence rate (95% CI)
Age group, years						
0-24	7/91 608	7.6 (3-16)	1/87 445	1.1 (0.03-6.4)	8/179 054	4.5 (1.9-8.8)
25-34	3/34 096	8.7 (1.8-26.6)	1/32 167	3.1 (0.7-17.3)	4/66 462	6.0 (1.6-15.4)
35-44	10/31 394	31.8 (15.3-58.6)	4/30 905	12.9 (3.2-33.1)	14/62 300	22.5 (12.3-37.7)
45-54	27/22 190	121.6 (80.2-177)	16/20 984	76.2 (43.6-123.8)	43/43 174	99.6 (72.1-134.1)
55-64	50/11 819	423.0 (328.6-576.9)	23/11 862	193.9 (136.4-311.1)	73/23 682	308.2 (241.6-387.6)
65-74	31/6220	498.4 (338.6-707.4)	33/7619	433.1 (298.2-592.8)	64/13 838	462.5 (356.2-590.6)
75-84	28/2438	1148.5 (763.2-1659.9)	38/3928	967.4 (684.6-1327.8)	66/6366	1036.7 (801.8-1319.0)
≥85	8/500	1600 (690.8-3152.6)	12/1136	1056.3 (545.8-1845.2)	20/1836	1089.3 (665.4-1682.4)
All	164/200 466	81.8 (69.3-94.3)	128/196 046	65.3 (53.9-76.6)	292/396 712	73.6 (69.3-77.9)
Adjusted Chile*		103.2 (87.4-118.9)		86.5 (71.5-101.5)		97.4 (86.2-108.6)
Adjusted Europe†						140.1 (124.0-156.2)
Adjusted world ‡						108.2 (95.8-120.6)
Adjusted world §						94.1 (83.3-104.9)

*Total population of Chile according to 2002 census. †Segis' European population. ‡WHO world population. §Segis' world population.

Table 1: Incidence rates per 100 000 population of first-ever stroke, by age and sex

The women have less incidence of Stroke in all age group

Clasification of stroke by Gender

	Infarction		Intracerebral haemorrhage		Subarachnoid haemorrhage	
	N	Incidence rate (95% CI)	N	Incidence rate (95% CI)	N	Incidence rate (95% CI)
Men						
0-24	2	2.2 (0.2-7.8)	5	5.5 (1.8-12.7)	0	-
25-34	1	2.9 (0.07-16.3)	1	2.9 (0.07-16.3)	1	2.9 (0.07-16.3)
35-44	4	12.7 (3.5-33)	4	12.7 (3.5-32.6)	1	3.9 (0.08-17.7)
45-54	12	54.1 (28-94.5)	9	40.6 (18.5-77.0)	4	18.0 (4.9-46.1)
55-64	32	271 (185-382)	14	118.4 (64.7-198.7)	2	16.9 (2-61)
65-74	26	418 (273-612)	4	64.3 (17.5-164.6)	0	-
75-84	21	861.4 (533-1317)	4	164.1 (44.7-420.1)	0	-
≥85	5	1000 (324-2334)	2	400 (48.4-1444.9)	0	-
All	103	51.4 (46.3-56.5)	43	21.4 (18.1-24.7)	8	4.0 (1.6-7.8)
Adjusted Chile		63.0 (50.8-75.1)		24.4 (17.1-31.7)		4.1 (1.3-6.9)
Women						
0-24	1	1.2 (0.03-6.4)	0	-	0	-
25-34	1	3.1 (0.08-17.8)	0	-	0	-
35-44	3	9.7 (2-28.4)	1	3.2 (0.08-18)	0	-
45-54	8	38.1 (14.4-75.1)	5	23.8 (7.7-55.6)	2	9.5 (1.2-34.4)
55-64	15	126.5 (70.7-208.6)	6	50.6 (18.6-110.1)	1	8.4 (0.2-46.9)
65-74	24	315.0 (201.8-468.7)	4	52.5 (14.3-134.4)	2	26.2 (3.2-94.8)
75-84	21	534.6 (330.9-817.2)	9	229.1 (104.7-434.9)	2	50.9 (6.2-183.9)
≥85	9	792.3 (362.3-503.9)	1	88.0 (2.2-490.5)	0	-
All	82	41.8 (33.3-51.9)	26	13.3 (8.6-19.4)	7	3.6 (1.4-7.3)
Adjusted Chile		52.0 (40.7-63.2)		16.1 (9.9-22.2)		4.2 (1.1-7.3)
Total Population						

There are not difference for etiology.

The women have more IH between 75 to 84 years old

Prognosis at 6 months

	mRankin 0-2		mRankin 3-5		mRankin 6	
	n	Rate (95% CI)	n	Rate (95% CI)	n	Rate (95% CI)
Sex						
Men (n=157)	79	50 (39.8-62.7)	25	16 (10.3-23.5)	53	34 (25.3-44.1)
Women (n=125)	53	42 (31.8-55.5)	32	26 (17.5-36.1)	40	32 (22.9-43.6)
Age-group, years						
0-44 (n=25)	9	36 (16.5-68.3)	6	24 (8.8-52.2)	10	40 (19.2-73.6)
45-64 (n=110)	67	61 (47.2-77.3)	17	15 (9.0-24.7)	26	24 (15.4-34.6)
65-84 (n=129)	51	40 (29.4-51.9)	32	25 (16.9-35.0)	46	36 (26.1-47.6)
≥85 (n=18)	5	28 (9.0-64.8)	2	11 (1.3-40.1)	11	61 (30.5-100.0)
Total (n=282)	132	47 (33.4-60.2)	57	20 (15.3-26.2)	93	33 (26.6-40.4)

Table 6: Prognosis at 6 months after first-ever stroke, by sex and age-group

The prognosis at 6 months is more poor in the women

Lancet 2005, 365:2206-15

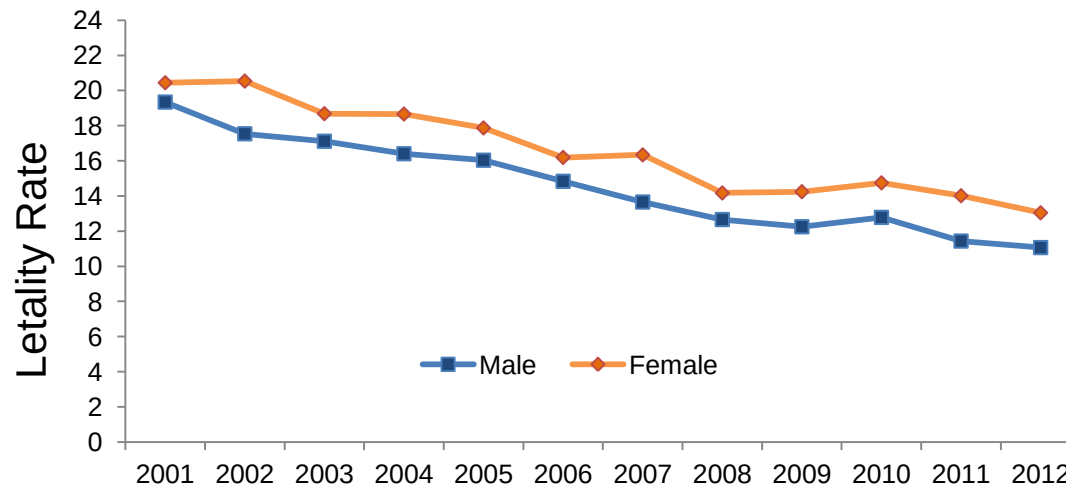
Incidence rates (per 100.000) of first-ever ischemic stroke subtype by sex in Iquique, Chile 2000-2002

		Cardioembolic		Atherothrombotic		Small vessel		Undetermined	
Sex									
Women	27	13.8 (9-20)	3	1.5 (0.3-4.5)	21	10.7 (6.6-16.4)	31	15.8 (10.7-22.4)	
Men	23	11.5 (7.2-17.2)	5	2.5 (0.5-5.1)	36	17.9 (12.6-24.8)	38	18.9 (13.4-26.0)	
All	50	12.6 (9.3-16.6)	8	2.0 (0.8-3.9)	57	15.8 (10.8-18.6)	69	17.4 (13.5-22.0)	
Adjusted rates									
Women adjusted		17.4 (10.8-23.9)		1.3 (0-3.1)		12.9 (7.4-18.4)		20.3 (13.3-27.3)	
Men adjusted		14.3 (8.4-20.1)		2.7 (0.06-5.3)		21.6 (14.5-28.6)		23.9 (16.4-31.4)	
Chile [*]		15.7 (11.3-20.1)		2.5 (0.7-4.2)		17.3 (12.8-21.8)		21.3 (16.2-26.3)	
Europe [†]		22.9 (16.5-29.2)		3.7 (1.1-6.3)		25.7 (19-32.4)		31.0 (23.9-38.3)	

Cardioembolic stroke is more frequent in women

Lavados P. Lancet Neurology 2007, 6:140

Case Fatality Rate by gender in Chile from 2001 to 2012

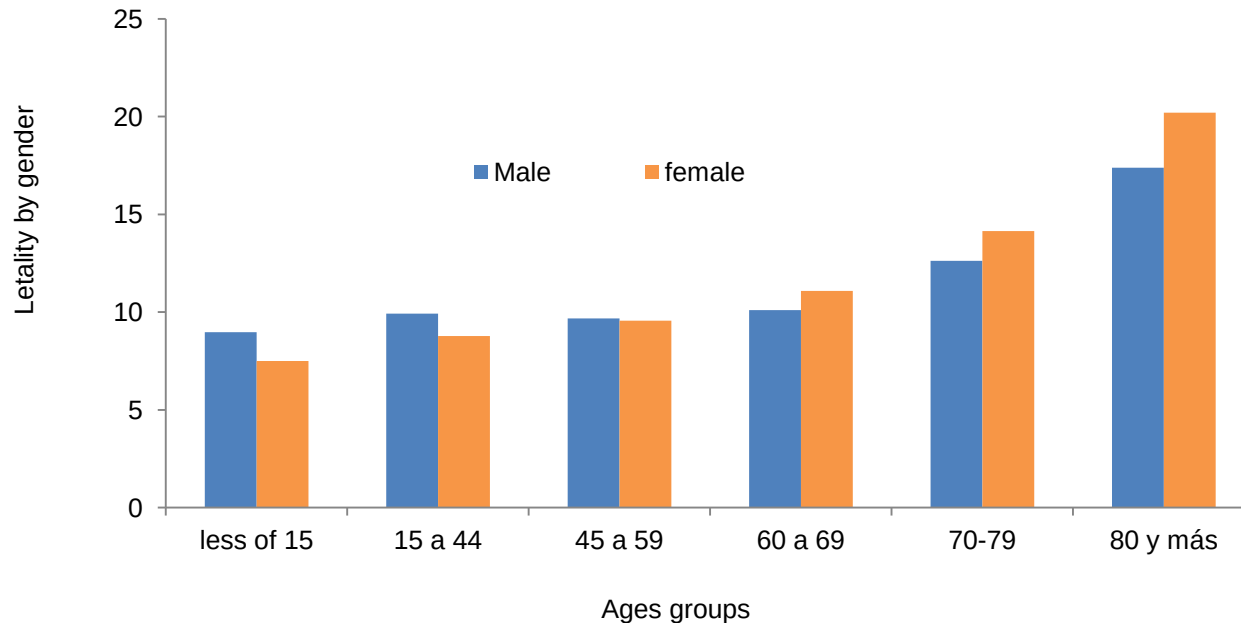


Case fatality rate has been decreasing in both but female has higher rate

Diaz V, 2015

WCN 2015

Case Fatality Rate by gender and Age group in Chile from 2001 to 2012



The women has higher letality in only ≥ 80 years old

Conclusions

- Incidence Rate is higher in men than women 103.2 versus 86.5 per 100.000
- The stroke Means age in women is 61.2 versus 68.5 in men
- The male have more Hospitalization Rates in all age groups
- The female has high case fatality Rate except in young group
- The prognosis measured in mRanin 0 to 2 is poor 50 versus 42 %
- The women have more cardioembolic stroke

Cardiovascular risk factors for women

- Personal history of CHD
- Age over 55
- Dyslipidemia
- Diabetes Mellitus
- Smoking
- Hypertension
- Peripheral arterial, cerebrovascular and aortic disease

Epidemiology of stroke in pregnancy and puerperium

- The incidence of stroke ranges from 9 to 13 x 100.000 deliveries worldwide
- Intracerebral hemorrhage during pregnant and puerperium carries the highest mortality and morbidity (20%)
- The risk for recurrent stroke in subsequent pregnancies is very low
- Unique causes of pregnancy-related stroke: preeclampsia-eclapsia, postparto angiopatya, amniotic fluid embolism and post parto cardiomyopathy

Standardized incidence rate ratios of sub-arachnoid hemorrhage, intra-cerebral hemorrhage and cerebral infarction

	Third trimester 2 days	before to 1 day after delivery	Day 2 to 6 weeks
Sub-achnoid hemorrhage	OR 95% CI 0.8 (0.2-2.5)	OR 95% CI 46.9 (19.3-98.4)	OR 95% CI 1.8 (0.5-4.9)
Intra-cerebral hemorrhage	1.3 (0.3-4.1)	95 (42.1-194.8)	11.7 (6.1-21.6)
Cerebral infarction	2.2 (0.8-4-8)	33.8 (10.5-84.0)	8.3 (4.4-14.8)

Ros HS. Epidemiology 2001, 12:456-60 (Swedish Cohort)

Stroke during pregnancy and Postpartum

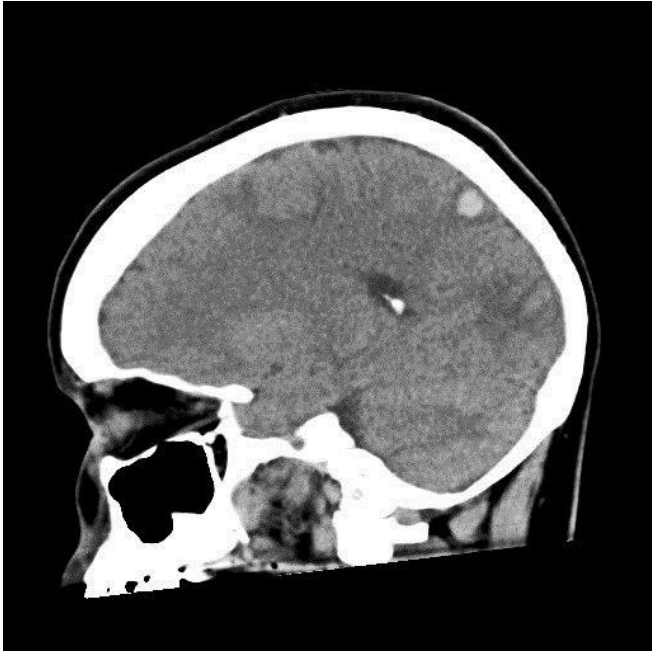
- Pre-eclampsia and Eclampsia.
- Reversible Cerebral Vasoconstriction Syndrome (RCVS)
- Intracranial Venous Occlusions
- Arterial Dissections
- Migraine

Physiological Changes during pregnancy

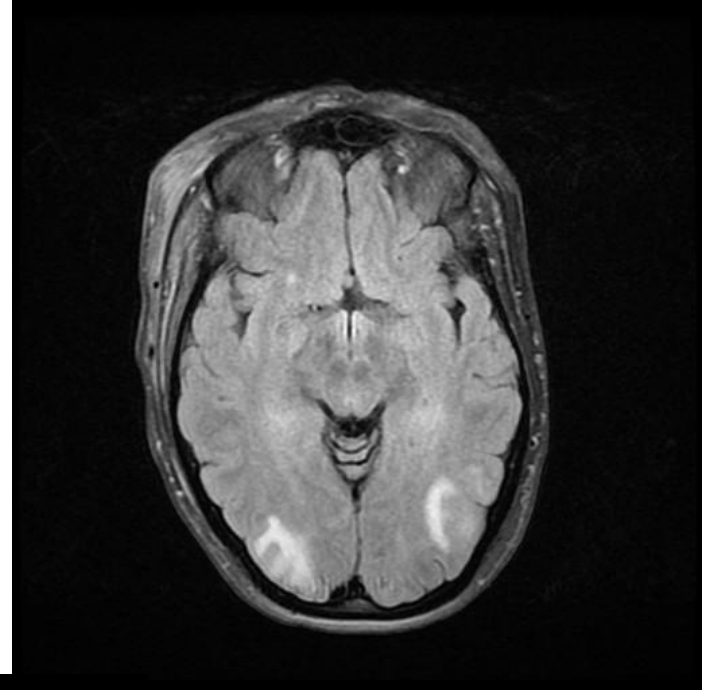
- Increase concentrations of estrogen
- Increase in blood and body fluid volume
- Increase in clotting factors
- Progesterone induced vasodilatation
- Post partum, the rapid decrease of progesterone can produce vasoconstriction and increase risk of ischemia

Case 1

- 38 years old, late primipara twins .
- During 33 weeks of pregnancy she started high BP, two days after she presented generalized seizure.
- BP 250/110, later after Labetalol, 170/100
- Underwent cesarean surgery
- CT, Angio-CT



CT Scan



Pre-eclampsia and Eclampsia

- It is a complex multi-system disorder, conferring risks for both ischemic and hemorrhagic stroke.
- Preeclampsia is present as a risk factor in 25 to 45% of cases of stroke in pregnancy and is associated with a 3–12 fold risk of stroke
- Many factors increase the risk of stroke: raised blood pressure, endothelial dysfunction, hemolysis, elevated liver enzymes and low platelets (**HELLP syndrome**) leading to fibrin deposition and platelet aggregation, hemoconcentration and the activation of the coagulation cascade

Preeclampsia and Eclampsia

- High BP over that during pregnancy
- Proteinuria
- Headache
- Leg swelling
- Restlessness
- Hyperreflexia
- difficulty concentrate
- Blurred vision
- Seizures
- HELP syndrome (hemolysis, elevated liver enzymes and low platelets)

Preeclampsia and Eclampsia

Brain and vascular lesions

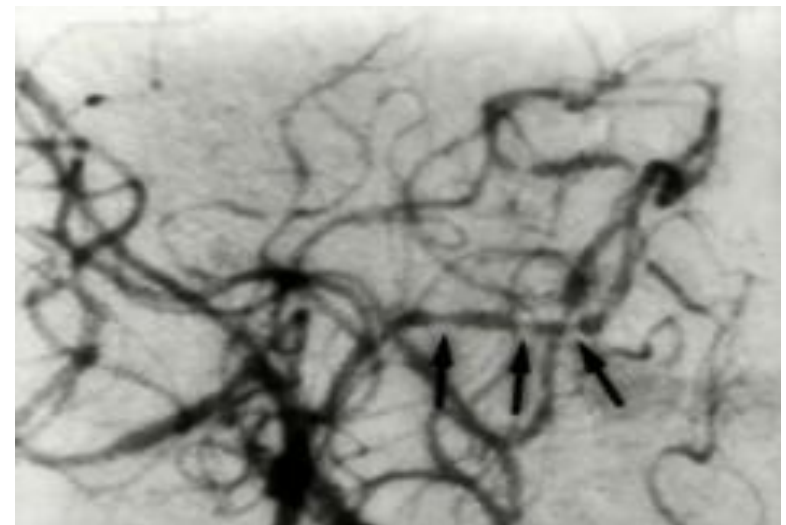
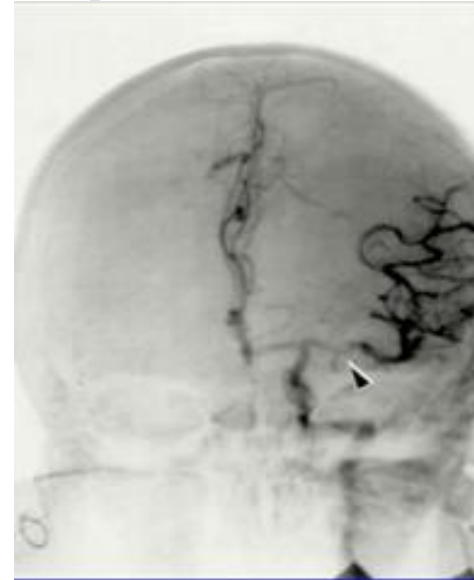
- Brain edema
- Vasoconstriction
- Focal infarcts
- Small or large hemorrhage
- PRES (posterior, reversible encephalopathy)

Reversible cerebral vasoconstrictions syndrome (RCVS)

- Thunderclap headache
- With or without focal neurologic deficits
- Reversible arterial segmental vasoconstriction
- The diagnosis is for MRI
- Under-diagnosed , because the most important priority is delivery of the infant

Reversible cerebral vasoconstrictions syndrome (RCVS)

- Transcranial doppler shows increased velocities early in the course
- CT angiography and MRA shows scattered regions of stenosis and dilatations, but it could take days for these test to be definitive
- Digital subtraction cerebral angiography is definitive test, but seldom is necessary



Posterior reversible encephalopathy syndrome (PRES)

- Symptoms:
- Headache
- Decrease level of consciousness
- Decrease of spontaneity and behavior
- Confusion
- Abnormal visual perception, cortical blindness, visual allusions and hallucinations
- Seizures
- Lateralized motor or sensory signs are unusual

