

# Incidence and mortality of Cerebral Venous Thrombosis in a Norwegian population

C.E. Harper<sup>1</sup>, K.W. Faiz<sup>1</sup>, K.G. Vetvik<sup>1</sup>, S. Zarnovicky<sup>2</sup>, J.M. Hansen<sup>3</sup>, E.S. Kristoffersen<sup>1,4</sup>

<sup>1</sup> Akershus University Hospital, Dep. of Neurology, Lørenskog, Norway.

<sup>2</sup> Akershus University Hospital, Dep. of Radiology, Lørenskog, Norway.

<sup>3</sup> Rigshospitalet – University of Copenhagen, Dep. of Neurology, Copenhagen, Denmark.

<sup>4</sup> University of Oslo, Dep. of General Practice, Oslo, Norway.

## Background and Aims

Cerebral venous thrombosis (CVT) is an uncommon form of stroke, which often affects women, younger adults and children compared to ischemic and haemorrhagic stroke. The diagnosis of CVT is challenging because of a highly variable clinical presentation. The annual incidence has previously been estimated around 3-5 per million, but recent studies have suggested higher figures. The catchment area of our department covers approximately 530 000 inhabitants, roughly 10% of the total population of Norway. All new cases of CVT can be found in this complete and well-recorded patient population. This will provide more reliable estimates of the population-based incidence of CVT.

## Methods

Retrospective chart reviews based on ICD-10 codes of all new cases of CVT at Akershus University Hospital in a 7-year period between 01.01.2011 and 31.12.2017.

## Results

62 patients were identified and included. 53% were females, and the mean age was 43.2 (range 0-80) years. The incidence of CVT was 1.75/100 000/year with no significant sex differences. The incidence for children and adolescents (n=9) was lower than for adults (n=53); 1.08 vs. 1.96/100 000/year, with the highest incidence for those > 50 years with 2.10/100 000/year. 10% of the adults had a known coagulopathy or thrombophilia as a risk factor. The 30-days and 1-year mortality rates were 3% and 6% respectively. Headache was the main symptom, presented in 83% of the patients. Risk factors were found in 73% of the patients, and for most of the patients it was a combination of two or more risk factors. Transverse sinuses and v. jugularis were the most frequent areas of thrombosis. In most patients, thrombosis occurred in several sinuses/veins. 98% of the patients were anticoagulated afterwards.

## Conclusion

The incidence of CVT in our population is higher than previously reported. The mortality rate was similar to previous studies.

Table

Clinical and imaging features	n (%)
Mean age (SD)	43.2
Female	33 (53%)
<b>Symptoms/signs</b>	
Headache	52 (83%)
Nausea/vomiting	28 (45%)
Motor deficits	20 (32%)
Seizures	20 (32%)
Sensory deficits	17 (27%)
Speech disorder	16 (26%)
Visual deficit	16 (26%)
Cranial nerve palsies	15 (24%)
Cerebellar signs	8 (13%)
<b>Sinus/vein involved</b>	
Transvers /Sigmoides Sinus	43 (69%)
V. jugularis	32 (52%)
Superior Sagittal Sinus	20 (32%)
Cortical veins	15 (24%)
Straight Sinus (Rectus)	9 (15%)
Deep venous system	9 (15%)
Multiple	44 (71%)
<b>CT/MR</b>	
Focal edema / Ischemic infarction	10 (16%)
Hemorrhage / hemorrhagic infarction	3/8 (17%)
<b>Risk factors</b>	
Prothrombotic conditions/coagulopathy	14 (23%)
Infection head/neck region	12 (19%)
Malignancy	8 (13%)
Puerperium*	6 (32%)*
Systemic infection	5 (8%)
Oral contraceptives*	3 (16%)*
Head trauma	3 (4%)
Unknown	17 (27%)
Anticoagulation	61 (98%)
* Percentage of female patients	