Cerebral Venous Thrombosis in Tropical Areas

Dr Chandrashekhar Meshram
Director, Brain and Mind Institute, Nagpur, India
drmeshram@hotmail.com
Disclosures

None

Due to copyright reasons, more images will be included in the final presentation.
Learning Objectives

• Risk Factors of CVT
• Clinical Manifestations of CVT
• Diagnosis of CVT
• Treatment of CVT
Why CVT is important

• Heterogeneous condition
• Varied clinical manifestation
• Change in pattern
• Different predisposing factors
• Good prognosis
## CVT – Age and Sex

<table>
<thead>
<tr>
<th>Country</th>
<th>Author</th>
<th>Year</th>
<th>N=</th>
<th>M %</th>
<th>F %</th>
<th>Mean Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>Christo P</td>
<td>2010</td>
<td>15</td>
<td>27</td>
<td>73</td>
<td>36</td>
</tr>
<tr>
<td>Chile</td>
<td>Truzillo O</td>
<td>2016</td>
<td>62</td>
<td>13</td>
<td>87</td>
<td>37</td>
</tr>
<tr>
<td>Morocco</td>
<td>Souirti Z</td>
<td>2014</td>
<td>30</td>
<td>30</td>
<td>70</td>
<td>29</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>Rizwana S</td>
<td>2019</td>
<td>26</td>
<td>42</td>
<td>58</td>
<td>29</td>
</tr>
<tr>
<td>Turkey</td>
<td>Duman T</td>
<td>2017</td>
<td>1144</td>
<td>32</td>
<td>68</td>
<td>38</td>
</tr>
<tr>
<td>Tunisia</td>
<td>Sassi S</td>
<td>2017</td>
<td>160</td>
<td>17</td>
<td>83</td>
<td>37</td>
</tr>
<tr>
<td>Pakistan UAE</td>
<td>Khealani</td>
<td>2008</td>
<td>109</td>
<td>47</td>
<td>53</td>
<td>35</td>
</tr>
<tr>
<td>India</td>
<td>Narayan</td>
<td>2012</td>
<td>428</td>
<td>54</td>
<td>46</td>
<td>31</td>
</tr>
<tr>
<td>India</td>
<td>Pai</td>
<td>2013</td>
<td>573</td>
<td>62</td>
<td>38</td>
<td>34</td>
</tr>
<tr>
<td>India</td>
<td>Meshram</td>
<td>2019</td>
<td>894</td>
<td>68</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>ISC VT-21C</td>
<td>Ferro J</td>
<td>2004</td>
<td>624</td>
<td>26</td>
<td>74</td>
<td>39</td>
</tr>
<tr>
<td>112 Studies</td>
<td>Zuurbier</td>
<td>2016</td>
<td>23638</td>
<td>35</td>
<td>65</td>
<td>37</td>
</tr>
</tbody>
</table>
Cerebral Venous Thrombosis
Risk Factors (Genetic)

- Deficiency of anticoagulants
  - Antithrombin III
  - Protein C, Protein S
- Abnormal Proteins
  - Factor V Leiden
  - Dysfibrinogen
- Increased Procoagulants
  - Prothrombin, Factor VIII
- Abnormal Metabolism
  - Homocysteinaemia
Cerebral Venous Thrombosis
Risk Factors – Acquired

- Tissue trauma – surgery
- Pregnancy & Puerperium
- Malignancy
- Sepsis
- Nephrotic syndrome
- Hyperviscosity state, Dehydration
- APLA , PNH
- Myeloproliferatus disorders
- Hyperhomocysteinaemia
- Oral Contraceptive
- Inflammatory diseases- Crohns, Behcets, ulcerative colitis
- Drug Abuse, Alcohol
Balance between Procoagulants & anticoagulants keeps the blood fluid & flowing.

Increased Procoagulants &/or decreased anticoagulants can lead to thrombosis.
Why CVT common in Tropical areas

- Anemia
- B12 Deficiency
- Hyperhomocysteinaemia
- Poor obstetrics care
- Dehydration
- Raised Hematocrit
- Infection
- Genetic
- Other environmental factors
Clinical Presentations
four main syndromes

- Raised intracranial Pressure
- Presentation with Seizures
- Stroke like Presentation with Focal Deficit
- Encephalopathy
GR 17 M

- Headache 3 wks
- Vomiting
- Papilloedema
• Swelling Lt side of neck
• Headache
• Diplopia – VI nerve palsy
• Papilledema
VK 36 m

• Headache – 5 days
• Seizures
• No focal deficit
NM 26 M

- Headache – 7 days
- Seizures – 4 days
- Rt. Hemiparesis – 1 day
PU 40 M

- Headache
- Seizures
- Rt. Hemiparesis
- Altered Sensorium
Uncommon Presentation

- Subarachnoid Hemorrhage
- Cavernous Sinus Thrombosis
- Multiple cranial nerve palsies
- Deep venous Thrombosis
- Psychological Symptoms
- Recurrent Syncope
- Hearing Impairment
• SJ 35 F
• Headache
• Altered Sensorium
M B 56 M

- Loss of memory and irrelevant Talk
- Wernicke Aphasia
- DM, HT
CVT Suspect if

- Young Patient
- First time headache
- Occipital Headache U/ L → B/L
- Neck Pain
- Headache - seizures
- Papilledema
- H/o Blackouts, Diplopia
- Insidious onset with indolent course
- Altered sensorium
Diagnosis
## CVT- Neuroimaging Studies

**MRI with MRV**

<table>
<thead>
<tr>
<th>Duration</th>
<th>T1</th>
<th>T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upto 5 days</td>
<td>Isointense</td>
<td>Hypointense</td>
</tr>
<tr>
<td>6-9 days</td>
<td>Hyperintense</td>
<td>Isointense</td>
</tr>
<tr>
<td>10-15 days</td>
<td>Hyperintense</td>
<td>Hyperintense</td>
</tr>
<tr>
<td>After 15 days</td>
<td>Hypointense</td>
<td>Hypointense</td>
</tr>
</tbody>
</table>

- Parenchymal Changes
- MRI using gradient T2* Susceptibility weighted sequences
- MRV – TOF – Time of flight technique
- Contrast enhanced MRV
CVT – Neuroimaging Study

CT Scan

- Dense Triangle Sign
- Cord Sign
- Parenchymal Abnormality
- CECT – Empty Delta Sign
- CT Venography
Lab Tests- D Dimer

- Meta-analysis of 14 studies
- Sensitivity – 93.9%
- Sensitivity - 89.7%
- Normal D Dimer does not exclude presence of CVT
CVT - Investigations

1. Hereditary Abnormalities
   Activated Protein C Resistance
   (Factor V Leiden)
   Antithrombin Functional Assay
   Protein C functional assay
   Protein S Functional Assay
   Fibrinogen

2. Acquired Abnormalities
   APLA
   Fasting Plasma Homocysteine Level
CVT – When to do tests for Thrombophilic factors

• During Stable State
• Not During Acute Thrombosis
• Not When on Anticoagulants
CVT - Treatment

• Symptomatic
• Treatment of Underlying cause
• Treatment of thrombotic Process
Treatment

• Anticoagulation  Aim
to recanalise occluded Sinus
Prevent Propagation of Thrombus
Treat underlying Prothrombotic state
CVT- Treatment
Anticoagulants

- Heparin
  I.V. unfractionated heparin
  Bolus 80u/kg followed by 18u/kg/hr
- LMW Heparin
Chronic CVT- Dural AVM
CVT Treatment

- Oral anticoagulants
- How long to continue
DJ 42 M

- Lt. Hemiplegia, Seizures
- Lupus anticoagulant +ve
IG 39 M

- CVT-On oral Anticoagulants for 2 years
- Asymptomatic
- Anticoagulants stopped
- After 2 weeks
Genetic Thrombophilia

- Lifelong anticoagulants
Evidence based medicine to experience based medicine
CVT – Treatment

Endovascular Thrombolysis

• Urokinase
• rtPA
CVT – Treatment

- Mechanical Thrombolysis
CVT – Treatment

- Decompressive Craniotomy
- Life saving measure in case of large venous infarction.
CVT – Prognosis

• Mortality
• Functional recovery is much better as compared to arterial stroke.
CVT – Key Message

• Key to diagnosis is – High index of suspicion.
• Disease of the young
• MRI with MRV is investigation of choice
• Investigate for predisposing conditions
• Early diagnosis would lead to early start of treatment and better prognosis
• Anticoagulation is the treatment of choice even in the patients with hemorrhagic lesions
CVT – References


