Spinal Cord Disorders
Epidemiology and Classification

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Accra, Ghana
Anatomy: Transverse section of spinal cord
Blood supply to the spinal cord: horizontal distribution

Posterior

Posterior spinal artery

Anterior spinal artery

The central area supplied only by the anterior spinal artery is predominantly a motor area
CLASSIFICATION OF SPINAL CORD DISORDERS

TRAUMATIC

NON-TRAUMATIC

COMPRESSIVE

NON-COMPRESSIVE
CLASSIFICATION OF SPINAL CORD DISORDERS

NON COMPRESSIVE

HEREDO-DEGENERATIVE

INFLAMMATORY

INFECTIVE

VASCULAR

NUTRITIONAL

COMPRESSIVE

EXTRADURAL

SUBDURAL
  • EXTRAMEDULLARY
  • INTRAMEDULLARY
syringomyelia
CLASSIFICATION OF SPINAL CORD DISORDERS

NON COMPRESSIVE

HEREDO-DEGENERATIVE

- Motor Neurone disease
  - Progressive Muscular atrophy
  - Amyotrophic Lateral Sclerosis and subtypes

INFLAMMATORY

- Spinal Muscular atrophy
  - Infantile
  - Childhood
  - Adult

INFECTIVE

- Hereditary spastic paraparesis

VASCULAR

- Syringomyelia

NUTRITIONAL

- Spinocerebellar degeneration
- Friedrich’s ataxia
CLASSIFICATION OF SPINAL CORD DISORDERS

NON COMPRESSIVE

HEREDO-DEGENERATIVE

INFLAMMATORY

INFECTIVE

VASCULAR

NUTRITIONAL

TRANSVERSE MYELITIS (IDIOPATHIC)

MULTIPLE SCLEROSIS

NEUROMYELITIS OPTICA

RADIATION MYELOPATHY
Neuromyelitis optica
CLASSIFICATION OF SPINAL CORD DISORDERS

NON COMPRESSIVE

- HEREDO-DEGENERATIVE
- INFLAMMATORY
- INFECTIVE
- VASCULAR
- NUTRITIONAL

POLIOMYELITIS

TB MENINGITIS, ARACHNOIDITIS, GRANULOMA, TUBERCULOMA

SYPHILIS

HIV

HTLV-1

SCHISTOSOMA AND OTHER PARASITIC LESIONS
CLASSIFICATION OF SPINAL CORD DISORDERS

NON COMPRESSIVE

- HEREDO-DEGENERATIVE
- INFLAMMATORY
- INFECTIVE
- VASCULAR
- NUTRITIONAL

INFARCTION
HAEMORRHAGE
AV MALFORMATION
AV FISTULA
CLASSIFICATION OF SPINAL CORD DISORDERS

NON COMPRESSIVE

HEREDO-DEGENERATIVE

INFLAMMATORY

INFECTIVE

VASCULAR

NUTRITIONAL

DEFICIENCIES

• Vit B12/FOLATE (SUBACUTE CORD DEGENERATION)
• Vit E

TOXIC

• LATHYRISM
• KONZO
• TROPICAL ATAXIC NEUROPATHY
Konzo patients (all from same family)  Typical spastic gait in konzo  Spastic feet in konzo

Source: NEUROLOGY IN AFRICA; William Howlett
LATHYRISM

India (1922)  Ethiopia  India

Source: NEUROLOGY IN AFRICA; William Howlett
CLASSIFICATION OF SPINAL CORD DISORDERS

COMPRESSIVE

EXTRADURAL
- DISCOVERTEBRAL DEGENERATION
- EPIDURAL ABSCESS, HAEMORRHAGE
- METASTASES

SUBDURAL
- EXTRAMEDULLARY
  - Meningioma
  - Ependymoma
  - neurinoma
- INTRAMEDULLARY
  - Glioma
  - Ependymoma
  - AVM
Tuberculous spondylitis
Tuberculous spondylitis
Tuberculous spondylitis
<table>
<thead>
<tr>
<th>Onset</th>
<th>Examples of pathophysiology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperacute</td>
<td>Traumatic</td>
</tr>
<tr>
<td></td>
<td>Vascular (haemorrhagic or ischaemic)</td>
</tr>
<tr>
<td>Acute</td>
<td>Compressive (abscess, tumour, intervertebral disc)*</td>
</tr>
<tr>
<td></td>
<td>Inflammatory (including infective and post-infective)†</td>
</tr>
<tr>
<td>Subacute</td>
<td>Metabolic (eg, B₁₂ deficiency)</td>
</tr>
<tr>
<td></td>
<td>Compressive</td>
</tr>
<tr>
<td></td>
<td>Inflammatory</td>
</tr>
<tr>
<td>Chronic</td>
<td>Compressive (eg, spondylotic)</td>
</tr>
<tr>
<td></td>
<td>Inflammatory (eg, HTLV-1 infection, primary progressive multiple sclerosis)</td>
</tr>
<tr>
<td></td>
<td>Heredo-degenerative</td>
</tr>
<tr>
<td></td>
<td>Syringomyelia</td>
</tr>
</tbody>
</table>

*Compression from abscess, tumour or disc may also be subacute or acute-on-chronic.

†Non-infective inflammatory lesions are usually subacute or chronic in onset, but can occasionally strike abruptly, as in ‘stroke-like’ presentations of multiple sclerosis.
Incidence and Prevalence

**Incidence**: the rate of new (or newly diagnosed) cases of the disease. It is generally reported as the number of new cases occurring within a period of time (e.g., per month, per year).

**Prevalence** is the actual number of cases alive, with the disease either during a period of time (period prevalence) or at a particular date in time (point prevalence).
<table>
<thead>
<tr>
<th>Classification</th>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive</td>
<td></td>
</tr>
<tr>
<td><strong>Extradural</strong></td>
<td>Pott’s disease, metastatic ca/myeloma, cervical spondylosis, epidural abscess, echinococcus cyst</td>
</tr>
<tr>
<td><strong>Subdural</strong></td>
<td></td>
</tr>
<tr>
<td>extramedullary</td>
<td>neurofibroma, meningioma</td>
</tr>
<tr>
<td>intramedullary</td>
<td>astrocytoma, ependymoma, tuberculoma, schistosome ova, syringomyelia</td>
</tr>
<tr>
<td>Non compressive</td>
<td></td>
</tr>
<tr>
<td>transverse myelopathy</td>
<td>viral infections, HIV, TB, syphilis, HTLV-1, Devic’s disease</td>
</tr>
<tr>
<td>nutritional</td>
<td>konzo, lathyrism, tropical ataxic neuropathy</td>
</tr>
<tr>
<td>vascular</td>
<td>sickle cell disease, dural AV fistula</td>
</tr>
<tr>
<td>hereditary</td>
<td>familial spastic paraplegia</td>
</tr>
</tbody>
</table>

**Common causes of paraplegia in Africa**

- Pott’s disease (TB)
- inflammation (transverse myelitis)
- malignancy (metastases)
- infection (HIV)
- nutritional (konzo)

Source: NEUROLOGY IN AFRICA; William Howlett
EPIDEMIOLOGY OF SPINAL CORD DISORDERS IN SSA

ETHIOPIA – ZENEBE – 1990-1994

- Tuberculous spondylitis: 27%
- HIV-associated Myelopathy: 17%
- Metastatic cord compression: 15%
- Tropical spastic paraparesis: 14%
- Cervical Spondylosis: 9%
- Primary Cord tumour: 8%
- Transverse myelitis: 4%
- Other: 4%
EPIDEMIOLOGY OF SPINAL CORD DISORDERS IN SSA


- Tuberculosis: 27%
- Degenerative cord disorders and infections: 21%
- Neoplasms: 28%
- Transverse myelopathy: 11%
- Guillain Barre syndrome: 7%
- Unknown: 6%
EPIDEMIOLOGY OF SPINAL CORD DISORDERS IN SSA


- Tuberculosis: 30%
- Cervical spondylosis with myelopathy: 13%
- Neoplasms: 14%
- Motor neurone disease: 6%
- Transverse myelitis: 11%
- Guillain Barre S-M: 11%
EPIDEMIOLOGY OF SPINAL CORD DISORDERS IN SSA

NIGERIA – OGUNNIYI – 1988-1993

- Spondyloptic Myelopathy; 30%
- Tuberculosis; 25%
- Neoplasms; 15%
- Other; 13%

13% in Nigeria – Ogunniyi – 1988-1993
### Epidemiology of Spinal Cord Disorders in SSA

<table>
<thead>
<tr>
<th>Country/Area</th>
<th>Authors</th>
<th>Study Period</th>
<th>Study Details</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ghana (Accra)</td>
<td>Nyzma</td>
<td>March 1991-February 1994</td>
<td>N/R (n=64; Males, n=38, Females, n=26)</td>
<td>Tuberculosis (30%, n=19), transverse myelitis (11%, n=7), Guillain Barre syndromes (11%, n=7), neoplastic conditions (14%, n=9), cervical spondylosis with myelopathy (13%, n=8), motor neuron disease (6%, n=4)</td>
</tr>
<tr>
<td>Nigeria (Ibadan)</td>
<td>Ogunniyi</td>
<td>1988-1993</td>
<td>N/R (n=104; Males, n=80, Females, n=24)</td>
<td>Spondyloytic myelopathy (30%, n=31), tuberculosis of the spine (25%, n=26), neoplastic (15%, n=16), myelitis (12%, n=12) and other causes (13%, n=13)</td>
</tr>
<tr>
<td>Nigeria (Ibadan)</td>
<td>Odaku</td>
<td>1962-1969</td>
<td>N/R (n=53; Males, n=39, Females, n=14)</td>
<td>8%</td>
</tr>
<tr>
<td>Nigeria (Ibadan)</td>
<td>Osuntokun</td>
<td>1957-1965</td>
<td>N/R (n=1,327)</td>
<td>N/R</td>
</tr>
</tbody>
</table>

### Review

**Etiology of spinal cord injuries in Sub-Saharan Africa**

N Draulans, C Kiekens, E Roels and K Peers
## Literature survey
### Epidemiology of spinal cord disorders

<table>
<thead>
<tr>
<th>Country</th>
<th>Authors</th>
<th>Study</th>
<th>Setting</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Traumatic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Nigeria</td>
<td>Igun et al.⁵</td>
<td>1984–1997</td>
<td>Retrospective. Hospital setting</td>
<td>68</td>
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<tr>
<td>Nigeria</td>
<td>Olasode et al.⁷</td>
<td>18 months</td>
<td>Prospective. Hospital setting</td>
<td>71</td>
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<tr>
<td>Nigeria</td>
<td>Obalum et al.⁸</td>
<td>1992–2006</td>
<td>Retrospective. Hospital setting</td>
<td>468</td>
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<tr>
<td>Senegal</td>
<td>Seye et al.⁹</td>
<td>1980–1988</td>
<td>Retrospective. Hospital setting</td>
<td>496</td>
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<tr>
<td>Sierra Leone</td>
<td>Gosselin and Coppotelli¹⁰</td>
<td>2000–2004</td>
<td>Retrospective. Hospital setting</td>
<td>24</td>
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<tr>
<td>South Africa</td>
<td>Hart and Williams¹³</td>
<td>1988–1993</td>
<td>Retrospective. Hospital setting</td>
<td>616</td>
</tr>
<tr>
<td><strong>Non-traumatic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Zenebe¹⁴</td>
<td>1990–1993</td>
<td>Retrospective. Hospital setting</td>
<td>130</td>
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<tr>
<td>Ghana</td>
<td>Nyame¹⁵</td>
<td>1991–1994</td>
<td>Prospective. Hospital setting</td>
<td>64</td>
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<tr>
<td>Nigeria</td>
<td>Ogunniyi et al.¹⁶</td>
<td>1988–1993</td>
<td>Retrospective. Hospital setting</td>
<td>104</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>Parry et al.¹⁷</td>
<td>1989–1994</td>
<td>Retrospective. Hospital setting</td>
<td>159</td>
</tr>
</tbody>
</table>
ETIOLOGY OF NON-TRAUMATIC SPINAL CORD DISORDERS IN SUB-SAHARAN AFRICA

[Bar chart showing the etiology of non-traumatic SCI in Sub-Saharan Africa, with categories for Tuberculosis, Neoplasms, Degenerative, and Myelitis. The chart includes data from Ethiopia, Ghana, Nigeria, and Zimbabwe.]
THE END

THANK YOU