Treatments & Side Effects

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Treatment

• Induction
  – Aim is to get disease to go away
  – Stop all inflammation and further damage

• Maintenance
  – Stop disease from coming back
Steroids

- AKA prednisolone, hydrocortisone, methylprednisolone, glucocorticoids
Steroids: Side effects

- Diabetes
- Glaucoma
- Cataracts
- Insomnia
- Slow growth (children)
- Thrush

Emotional disturbance
- Enlarged sella turcica
- Moon facies
- Osteoporosis
- Cardiac hypertrophy (hypertension)
- Buffalo hump
- Obesity
- Adrenal tumor or hyperplasia
- Thin, wrinkled skin
- Abdominal striae
- Amenorrhea
- Muscle weakness
- Purpura
- Skin ulcers (poor wound healing)
Steroids

• Key drug in treatment
  – Rapid control of inflammation

• Aim to reduce relatively quickly
  – Steroids are main cause of early infections
Plasma exchange

Plasma Exchange (PE) treatment diagram
Plasma exchange

• Removes antibodies (ANCA) and replaces with healthy plasma

• Need to insert a cannula into a large vein

• Main risks are infection, increased risk of bleeding and low calcium
Cyclophosphamide

Cyclophosphamide is metabolized by the liver enzyme CYP 2B6 to form 4-OH cyclophosphamide. This active metabolite can damage DNA, leading to cell death.

Metabolism:
- Liver CYP 2B6 converts Cyclophosphamide to 4-OH cyclophosphamide.
- 4-OH cyclophosphamide can form aldophosphamide, which is further metabolized.
- Aldophosphamide can be converted to acrolein and phosphoramidemustard.

Damage:
- Damages DNA causing cell death.
Cyclophosphamide

- Can be given either orally or as an IV pulse
- IV pulse gives less cyclophosphamide
Cyclophosphamide: Side effects

- Nausea, vomiting
- Temporary hairloss
- Infections
- Low blood cell count
- Infertility
- Cancers
  - Bladder cancer
  - Other cancers
Rituximab

Humanised mouse antibody that kills your B cells
Rituximab: Side effects

- Allergic reaction
- Increased risk of reactivating hepatitis viruses
- May increase risk of other viral infections
- Some patients have reduced level of antibodies (hypogammaglobulinemia)
Rituximab

• Shown to be equivalent to cyclophosphamide

• Very useful if disease relapses

• Well tolerated
Azathioprine

Our genes are made of DNA which go on to make all the building blocks of life.

Azathioprine reduces production of DNA.
Azathioprine: Side effects

- Hepatitis
- Low blood count, infections
- Long-term increased risk of cancer
Methotrexate

- Inhibits the vitamin folic acid which is needed to make DNA
- Most patients have to take folic acid with it
Mycophenolate mofetil

• An alternative to azathioprine

• Works in similar way

• Side effects
  – Diarrhoea
Methotrexate: Side effects

• Lung scarring
  – Stop if you notice worsening breathlessness

• Liver scarring
  – Regular tests of liver function

• Low blood counts
Summary

• Drugs are powerful but effective
  – Most patients will go into remission

• Side effects are well known
  – Careful monitoring requiring
  – Aim for lowest dose to control disease
  – Most patients are able to stop drugs but disease may recur