LEARNING OBJECTIVES

- Define
- Know the pattern of inheritance
- Enlist types and classify according to severity
- Describe the clinical features and complications
- Plan pertinent investigations, interpret and take appropriate action
- Manage and plan prophylaxis
- Counselling of the patients and parents

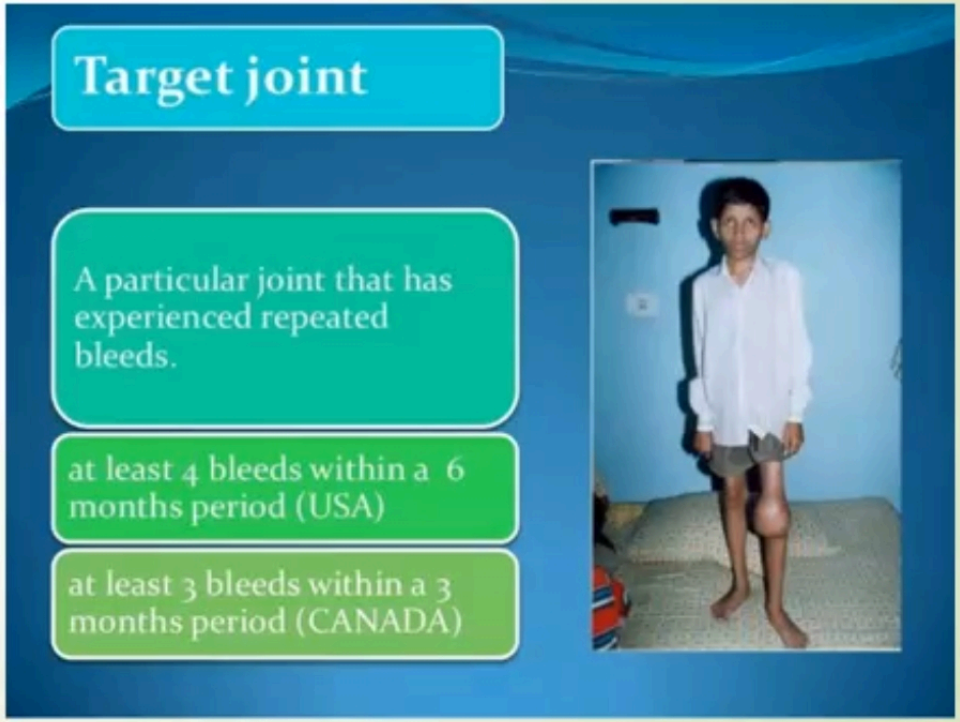
- **Hemophilia A** (factor VIII deficiency) **Hemophilia B** (factor IX deficiency) are the most common and serious congenital coagulation factor deficiencies.
- It is an X-linked recessive condition.
- **Hemophilia C** is caused by factor XI deficiency. It is an autosomal recessive condition.

- **Severe Hemophilia:** <1% activity of the specific clotting factor and bleeding is often spontaneous
- **Moderate Hemophilia:** Factor level of 1-5% and usually require mild trauma to induce bleeding
- **Mild Hemophilia:** Factor level >5% and require significant trauma to cause bleeding

CLINICAL FEATURES

- Bleeding may be present from birth.
- 2% of neonates sustain intracranial hemorrhage
- 30% of male infants with hemophilia have post circumcision bleed
- In children easy bruisibility, intramuscular hematoma and hemearthroses begin when child start to cruise

- Hallmark of hemophilia is hemarthrosis
- Iliopsoas haemorrhage presents as referred pain to groin, hypovolemia, internally rotated flexed hip… confirmed by USG or CT scan hip joint



COMPLICATIONS

- ICB: fits, headache, LOC,hemipariesis
- Vertebral column bleed : severe neck & back pain with ascending paralysis
- RETROPHARYNGEAL BLEED: dysphagia, drooling
- RETROPERITONEAL BLEED: pain & mass , bruise on abdomen
- PERIPHERAL NERVE COMPRESSION: femoral nerve (iliopsoas haemorrhage)

- Sciatic (gluteal), ulnar, median(forearm flexors)
- PROBLEM JOINTS: stiff joints due to contracture with poor mobility.
- CLD due to recurrent transfusions: jaundice, abdominal distension, edema, bleeding

INVESTIGATIONS

- Prolonged **PTT**
- Normal Platelet count, bleeding time, PT, thrombin time
- Specific **assay for factor VIII and factor IX**
- In 25%-35% cases antibodies are present due to factor VIII infusion so do **Bethesda test** to identify antibodies

MANAGEMENT & PROPHYLAXIS

- Early appropriate therapy is the hallmark of excellent haemophilia care.
- In mild to moderate bleeding value of factor VIII and factor IX must be raised to haemostatic level in 35-50% range.
- For life threatening or major haemorrhage dose should aim to achieve level of 100% activity
- 1 ml of cryoprecipitate increase factor VIII activity by 5-10%

- FFPs: contain factor 2,5,7,9,10,11,anti-thrombin III, protein C & S
- Cryoprecipitate: contain factor 1,8,13
- Cryoprecipitate contains 100 unit of FVIII/bag

FACTOR	VIII	IX
1 ml of FFPs	Inc. activity by 2%	Inc activity by 1%
Half life	12 hrs	20-22 hrs
Dose IU	Dose IU factor VIII= % desired rise in FVIII×body wt.× 0.5	Dose IU factor IX= % desired rise in IX×body wt× 1.4
Desmopressin for mild to moderate bleed	1 puff (150micgm) <50kg I/N 2 puff (300micgm) > 50kg I/N Or 0.3 microgm/kg I/V	Not effective

- **INHIBITORS**: IgG Ab. against epitopes of FVIII and IX
- 25-35 % in A, rare 1-4 % in B
- 35-50% low responders, 50-65% high responders
- Low responders: desensitization, high dose more frequent FVIII infusions
- Hi responders: Need FVIIa conc 90-120 IU/kg until bleeding stops every 2 hrs. or for at least 24 hrs. for major surgery
- **ITT: Immune tolerance therapy:** Recurrent exposures to regular infusions of F VIII-IX, eradicates inhibitors by manipulating immune system, plasma derived FVIII 40IU/kg 3 times/week

- **WHO FAIL TO RESPOND TO ITT**: rituximab, IVIG,plasmapheresis, steroids, CPA
- Recombinant FVIIa or activated prothrombin complex
- Anti inhibitor coagulant complex (FEIBA)
- PREVENTION: Apply pressure 10 min after injection, give SC injection, not IM
- Level should be raised to 50% 30 min before LP

- **SURGERY**: Synovectomy (open, laproscopic or isotopic i.e. intraaticular instillation of chemicals)
- HAEMARTHROSIS: immobilize with splint, analgesia with paracetamol or ponston
- HYDROTHERAPY in acute joint bleed.
- **Musculoskeletal bleed T/M is RICE**
- R: REST
- I: Immobilize
- C: Ice compression
- E: elevation
- **RECENT ADVANCES:** Gene therapy

- **Primary prophylaxis:** FVIII started before 1st joint bleed or after 1st bleed, often at age < 2 yrs.
- **Secondary prophylaxis:** After joint bleed is well established occured. 1-2 times per week or every 2-3 days to maintain a trough level of 1-2 % when measured before next infusion, 52 or 48 weeks per year, life long or after adulthood is questionable.

COUNSELLING

- Life long disease
- Avoid intramuscular injections
- Avoid contact sports
- Avoid aspirin
- In case of bleed bring to hospital

- Q1: What is Pattern of inheritance of hemophilia A?

Autosomal recessive

Xlinked recessive

Autosomal dominant

Mitochondrial

- Q2: What is main symptom of hemophilia?

Bleeding

Muscle Pain

Headache

Fatigue