About Haemophilia

Haemophilia is a rare blood disorder in which the blood does not clot adequately, and results from an intrinsic genetic mutation affecting either of clotting proteins named- Factor VIII or Factor IX, producing two types of Haemophilia- Type A or B respectively. This deficiency can become life-threatening in emergency, and the survivors frequently bear the brunt of long-lasting musculoskeletal disabilities. Though present since birth or earlier, the disease may become damaging at any time, with bleeds that are spontaneous or principiated by trauma, trivial or otherwise, surgical or medical interventions, or sometimes drugs. The good news is there is a highly effective drug treatment available to bring the life back to normal.

- **What is haemophilia?**

In normal human beings, there are number of clotting proteins (called Factors) in blood. These protein Factors help in clotting (coagulation) of blood, by a cascade process leading to an eventual Clot which stops the bleeding.

In Hemophilia, there is deficiency of a clotting Factor leading to failure of clotting the blood in times of need.

Hemophilia is usually a hereditary disorder of coagulation due to mutational deficiency of either clotting Factor VIII or of the Factor IX in blood, thereby giving rise to two variants of haemophilia- Type A and Type B respectively.

The genes affected in Haemophilia is on the sex Chromosome-X (of the XY set). With the presence of two X in women, the disease in females (with one X affected) is milder and behaves as carrier. The men have only one X chromosome (the other being Y), and have to bear the brunt of severe disease. The disease is almost exclusively seen in males while the females are asymptomatic carrier. Rarely can it occur in females

The family history is thus important.

- **Prevalence of hemophilia**

The prevalence of Hemophilia-A is estimated at 1 in 10,000 live births and severe form of Haemophilia-A may be about 6 per 100,000 population. Haemophilia-B is about 3-4 rarer.

- **Are those with '*No Family History of Haemophilia'* safe or immune from haemophilia?**

Presence of positive family history is important, wherein disease may be transmitted from the carrier mothers to her sons as disease and daughters as carrier. The family history is helpful only when positive, esp. in settings od smaller families under changing times or presence of mild asymptomatic diseases. Nevertheless, the genetic defects corroborate the hereditary defect of the disease.

However, true family history of hemophilia may be present in $2/3^{rd}$ of cases and $1/3^{rd}$ cases occur without positive family history even on lab testing. Thus, one out of three patients develops the haemophilia disease as a fresh genetic mutation and transmitted down.

- **Types and Severity of hemophilia**

When clotting Factor VIII is deficient, it is called Hemophilia A and when the deficient factor is Factor IX, the disease type is named Hemophilia B (Christmas Disease). Hemophilia A comprise about 80% of all haemophilia

Haemophilia with less than 1% of clotting Factor activity level in blood generally suffer from severe symptoms and complications, and are categorized as Severe Haemophilia (A or B). With blood Factors level ranging 1-5% are Moderate severity hemophilia and when the clotting Factor levels are 5-40 % it is categorized as Mild hemophilia.

Majority of the haemophilia fall in the category of Severe Haemophilia i.e., less than 1% clotting Factor activity level in blood.

- **Symptoms of hemophilia**

Haemophilia can lead to spontaneous or trauma related bleeding typically in large joints or muscles. Usually knee, elbow, ankle, wrist and shoulder joints are involved leading to acute, severe pain, swelling and limitation of joint movements. Besides the acute symptoms, the patients frequently develop lingering and chronic disabilities affecting esp. their musculoskeletal organs leading to greater morbidity and mortality if not treated properly.

The bleeds can infrequently occur in brain, inside lugs and chest, inside abdomen and pelvis, but are often life-threatening.

Bleeding can occur from nose, mouth, gums, in urine etc.

In severe hemophilia episodes of bleeding can occur without any trauma whereas in moderate hemophilia bleeding usually occurs after minor trauma or surgery. In mild hemophilia, only occasional bleeding occurs due to significant trauma or surgery.

- **Precautions in Hemophilia**

With current treatment modalities, the precautions are diminishing. However, our systems still do not provide adequate and appropriate treatments as per standard of care. Thus, due precautions are warranted.

Persons with hemophilia should avoid high contact vigorous sports activity. They should keep away from injury prone activities in day-to-day life. They should avoid being overweight. Intra muscular injections must be avoided. They should not use common pain killers like aspirin, ibuprofen etc. and use of hot fomentation for emergency bleeds should also be avoided.

A proper exercise schedule under guidance of physiotherapist should be followed. In case of acute bleeding, they should contact the health facility for immediate proper care.

- **Home care of suspected bleed in hemophilia (until clotting factor can be injected)**

Follow the PRICE regimen
P- Protection from injuries

R- Rest to the affected part
I- Ice packing
C- Compression
E- Elevation

In case of bleeding in joint, affected part should be rested, properly supported, elevated and splinted till hospital care is made available.

Ice packs are applied intermittently to affected part for 15-20 min. for 4-6 times every day. Crushed ice can be wrapped in a moist cloth in a towel and placed around the area.

- **Hospital care in hemophilia**

If home therapy with clotting factors is not available/ accessible, the patients should report to the nearest hemophilia health care facility without delay. Hospital will provide clotting Factor infusion along with the other supportive care and treatment..

- **Drug Treatment for in hemophilia**

It started with treatment using blood plasma derived products concentrated in deficient clotting Factor… like FFP, Cryoprecipitate, plasma derived Factor VIII or IX.

During the 1980s, came the sequencing of Factor VII, leading to commercial production of recombinant Factor VIII, to be soon followed with recombinant Factor IX during the nineties.

These recombinant Factors were safer with practically no risk of transmitting known or unknown viral or prion infections. Also, the limitation on production quantity was not there.

Thus far, the plasma-derived and recombinant Factors VIII and IX mimicked the half-life of standard naturally occurring Factors (SHL) which was a big impediment in better compliance and adherence owing to injection every couple of days.

This was followed by extension of half-life of Factors- VIII and IX- for haemophilia A and Haemophilia B during the first decade of current century.

Lately, non-factor products in form of bispecific monoclonal antibodies as *Emicizumab* has been introduced for Haemophilia A with great promise of being effective in Haemophilia-A with or without inhibitors, and that too with once-a-month injection via the comfortable subcutaneous route.

It is being followed by anti-TFPI antibodies, found effective in both Haemophilia-A and Haemophilia-B via subcutaneous route.
Many more are in pipeline.

- **Is there Gene Therapy for Haemophilia?**

After long drawn research, there is successful gene therapy for both Haemophilia-A and Haemophilia-B.

And the Gene Therapy is approved for patient treatment in many countries. It is not come to India so far, but likely to make its appearance in due course.

One limitation is the extremely high cost. Also, the long-term effects and outcome results are awaited.

- **Surgery in hemophilia**

Haemophiliacs can undergo emergency and planned surgeries under the cover of adequate replacement with the deficient clotting Factor.
Expert consultations and medications are mandatory.

- **Complications of hemophilia**

Repeated bleedings in joints in absence of treatment can lead to chronic swelling of joints, chronic pain, impaired joint mobility, thinning of muscle, crippling joint deformities and even unusual proliferation of tissue producing small or large tumours called pseudotumours. Bleeding in brain and other large cavities of body are a serious complication. The local effects of obstruction or chronic nerve damages produce neurological complications. Without adequate timely care, hemophilia leads to serious damage to limbs and joint functions within first few years of life. It can lead to thinning of muscles and can be a handicap for patients.

Patients exposed to blood products may be prone to acquire transfusion transmitted viral infections such as human immune deficiency virus (HIV), hepatitis B and hepatitis C viruses.

- **Physiotherapy in hemophilia**

Proper physiotherapy helps in strengthening of joints and muscles. It is must for all hemophilic patients before and after the bleeding episodes. Physiotherapist guides about daily movements and exercises. It helps to restore muscles strength and increase range of motion for diseased joint and help to live a normal life.

Minor procedures like dental extractions, cataract surgery can be done on day care basis.

- **Counseling in hemophilia**

Counseling is provided to patients and family member for day-to-day management of hemophilia.

Genetic counseling is provided to prospective couples and people in their reproductive years of life.

- **Support and education**

- **Frequently asked questions**

Are factors available free of cost?
What are the side effects of factor?
What is railway concession available to hemophilia patients?
Is there any vaccine available for hemophilia?
Can a hemophilic do swimming?

Who benefits from genetic counseling?
Is hemophilia a contagious disease?

- **Where can I find more information**

Do check the haemophilia websites
You can go through the website of our ***Haemophilia & Health Collective of North®***
www.hhcn.in

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