Expansion of Genetic Haemochromatosis programme at Northern Ireland Blood Transfusion Service

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Genetic Haemochromatosis in Ireland

- The Celtic Curse is a term often used to describe Genetic Haemochromatosis(GH) as it has the highest incidence in the world in the island of Ireland, with approximately 1 in 8 people carrying the gene.
- The inheritance (autosomal recessive) of mutations in the HFE gene on both copies of chromosome 6 can lead to excessive absorption of iron from food, resulting in organ damage over many years.
- Genetics of Haemochromatosis in the UK:
  - ≥ 90% homozygous for the C282Y mutation (p.Cys282Tyr). 1 in 200-400 North European origin.
  - 4% compound heterozygotes (C282Y/H63D)
  - Remainder – other rarer forms
- Removing blood from a person with haemochromatosis is the standard treatment for the condition.

Historically two main concerns using blood from GH donors

1. Safety of blood
   - Concern regarding microbial contamination by siderophilic bacteria and potentially higher susceptibility to viral infections due to higher levels of iron impairing the host immune response (De Buck et al, 2012).
   - Studies (Bullen et al, 1991 & Jolivet-Gougeon et al, 2008) regarding siderophilic bacteria are small and lack sufficient power
   - French study (Jolivet-Gougeon et al, 2007) compared seroprevalence of anti-Yersinia antibodies in regular & GH donors – no difference
   - Large US study (Sanchez et al, 2001) examined > 50,000 donors, including 200 GH: no difference in rates of positive screening results of blood borne viruses
   - Prospective study (Leitman et al, 2003) followed 130 GH over 27 months – no infections
   - Undiagnosed GH donors donating without any apparent reported adverse events.

2. Altruism

- But can be argued (Pennings, 2005) that there is a different moral value attached to the 2 distinct parts of the process:
  - Health benefits relate to phlebotomy & not disposition of blood: no difference if donated or discarded
  - Can still be driven by a morally valid altruistic motivation

Genetic Haemochromatosis & blood donation in UK

- The UK DSGs entry for Haemochromatosis currently reads:
  - *Obligatory*: Refer to a 'Designated Clinical Support Officer' if Therapeutic venesection has been required or is planned.
  - *Discretionary:* If treatment has not been required, accept.
  - *Additional information*: Receiving blood from a donor with haemochromatosis presents no additional risk compared to any other transfusion. Removing blood from a person with haemochromatosis is the standard treatment for the condition. However the condition can cause serious heart problems and other organ damage. It is also important that the overall management of a person with haemochromatosis is properly managed. This is why a referral to a **'Designated Clinical Support Officer'** is required if therapeutic venesection has been required or is planned.

Setting up GH programme in NIBTS

- NIBTS set up its GH programme in 2005, initially as a pilot project.
- A separate GH panel was set up on PULSE using an apheresis panel to allow more frequent venesection of these donors.
- Letters were sent to local physicians informing them of the study and entry criteria.

Current position

The pilot proved very successful and now 11 years later NIBTS have 259 active GH donors.

- Profile of active donors:
  - M:F ratio - 70:30
  - Age: 21-30 (2%); 31-40 (20%); **41-50 (33%);** 51-60 (29%); 61-70 (24%); 71-80 (1%)
  - Blood groups: **44% O+**; 26% A+; 9% B+; 8% O-; 7% A-; remainder B-, AB-, AB+.
  - Frequency of donation: 68% maintenance vs 32% de-ironing
  - 36 new GH donors in 2015 & 34 this year to date.
  - Total number of units donated in 2015: **719** (1.4% of total 50,791)
  - Of the 719 units donated, 557 were issued and 162 discarded (**23% discarded**)

Referral process

- The medical team at NIBTS receives a written referral from GP/Consultant detailing HFE gene test results, iron profile, medical history (confirmation of no end organ damage related to GH) and requested venesection protocol. The overseeing physician confirms that they will continue to review the patient, perform iron studies, and provide clinic letters to NIBTS.
- We accept referrals for patients in the de-ironing stage (venesection is performed as frequently as the clinician requests i.e. weekly/fortnightly) and in the maintenance phase.
- All donors are invited to NIBTS HQ for an appointment with a medical officer to assess eligibility.
- If a donor has a temporary reason why they cannot donate (e.g. infection, recent travel) then we can do a bleed/discard option.

Prior to 2016

- Up until this year we required all blood donors with GH requiring venesection to attend our HQ in Belfast:
  - donors placed on apheresis panel
  - managed by medical team (no doctors out at session)
  - did not have robust measures in place out in community for nurses to manage donors e.g. ensure any potential infected donation does not enter blood supply

Expansion of programme

- NIBTS received a lot of queries over the recent years from both patients/donors with GH and their referring doctor regarding donation at a local community session (NIBTS has on average 700 donation sessions serviced by four collection units)
- A change control was raised and progressed last year to accept referrals for GH patients in the maintenance phase that wish to become a blood donor and donate at their local community session. This involved a number of actions:
  - New PULSE code (to register & identify these donors) and place all donations on hold pending medical review
  - Creation of file for each donor (medical letters, iron profiles, session slips, venesection record etc.)
  - Review of SOPs & policies (medical & nursing) to include General Health & Haemoglobin, Donation Procedure, PDI
  - Training of nursing staff
  - Update leaflets & website for donors
  - Sent information to Consultant Haematologists, Gastroenterologists, Hepatologists, & GPs.
  - Share information with Genetic Haemochromatosis Society

What happens when I attend the Blood Transfusion Service?

You will be interviewed and asked to complete and sign a HealthCheck questionnaire. If accepted, you should be able to give your first donation that day. On subsequent visits to NIBTS you would follow a similar procedure to that of a regular blood donor. If you are undergoing de-ironing, you will need to have all of your venesections performed at NIBTS HQ. We encourage you to make an appointment (9am-5pm) for all your subsequent venesections.

If you are undergoing maintenance treatment you can if you prefer attend a local community donation session after your initial assessment in NIBTS HQ. If you wish to do this we will register you onto your preferred community session and you will then receive correspondence from our donor administration staff calling you to donate when they are next in your area.

There are a number of reasons why a donor is temporarily deferred, including foreign travel, infection, surgery, and medical investigations. All donors are asked about these on the HealthCheck questionnaire each time they come to donate. As GH patients require venesection to treat their condition, a donation can be accepted from GH patients in these cases but marked for discard. This means the donation will not go forward for patient use. Obviously we would like to make available to patients as much of the blood from GH patients as possible so we ask that you attend for donation when you are well and think that you satisfy the selection criteria. Further information can be obtained on donor eligibility rules on our website: www.nibts.org.

How does blood donation differ from venesection in hospital?

As already stated overleaf, blood donation involves either attending the NIBTS HQ or local community donation session. It also involves completion of a healthcheck questionnaire at each visit. Another important difference is that each blood donation will be tested for certain infections that can be transmitted by blood transfusion to patients. These include HIV, Hepatitis B, Hepatitis C, Hepatitis E and Syphilis. In the event of a positive result for any of these tests you will be informed of the result and given appropriate advice.

Who will be responsible for my medical supervision?

Your hospital consultant or GP will still be responsible for your medical supervision and monitoring of your condition. They will also be responsible for checking your iron levels. NIBTS does not perform iron studies. A finger-prick test will be performed on each visit to ensure your haemoglobin is satisfactory for donation.

What do I do next?

If you are interested in joining our NIBTS GH panel, please ask your hospital consultant or GP to send us a referral letter as detailed under section 'How do I donate my blood to the Blood Transfusion Service?' We will then be in touch with you regarding an appointment.

Further queries

If you require any further information you can contact NIBTS on 028 9032 1414 and request to speak to a member of the medical team.

Northern Ireland
Blood Transfusion Service

Information for Donors

Blood Donation and Genetic Haemochromatosis

Lisburn Road, Belfast, BT9 7TS
Tel: 029 9032 1414

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Current procedure

- Following an initial medical assessment at HQ (we no longer have medical staff out on session) eligible donors can be placed on their chosen donation panel.
- Patients undergoing de-ironing need to continue to come to Belfast HQ, as donors attending community sessions must adhere to the normal donation interval (minimum of 12 weeks for males and 16 weeks for females). Also it would not be feasibly possible to attend all community sessions as frequently as required to accommodate these patients in the de-ironing phase
- The normal NIBTS donation interval does not apply to donors undergoing de-ironing and they will join a separate apheresis panel because the donation interval is discretionary.

Haemoglobin Thresholds

- Lower limit haemoglobin measurements 135g/l and 125g/l for male and female donors respectively may be lowered for GH donors.
- Absolute limit for blood donation is 100g/l for both male and female GH donors.
- GH patients attending community donation sessions can only be accepted with haemoglobin within 10g/l below threshold i.e.
  - Males with a Hb of ≥ 125g/l can be accepted but donation will be set for discard
  - Females with a Hb of ≥ 115g/l can be accepted but donation will be set for discard
  - Any donor with a Hb below these figures cannot be accepted for venesection at community sessions. They will require to be referred to NIBTS HQ for venesection following medical assessment. Their Hospital Consultant should be informed of their Hb level.

Future plans

- NIBTS is currently working with hospital trusts & GPs to improve the service to the GH patients and their doctors in NI by:
  - performing iron profiles on GH donors.
  - Setting up a second fixed donation site in the West of NI to accommodate those requiring de-ironing in whom it is not convenient to travel to Belfast.
  - setting up an electronic referral system. Currently operating in Australia since 2013 (Transfusion Medicine August 2015 25)
    - > 8000 referrals to date
    - More efficient:
      - only accepting GH with genotypes associated with iron overload
      - Decreased time to get appointment
      - Decreased number of DNA
      - Site also gives information on other causes of increased ferritin

GH donor satisfaction questionnaire

- A questionnaire was sent to all our GH panel donors in June 2012 seeking information on their general satisfaction with the service at NIBTS and how it could be improved. 50% of donors responded. Notable findings were:
  - 81% stated a preference for attending NIBTS for venesection, citing the friendliness and skill of staff, convenience of the appointments and location, and atmosphere and the use of their blood for transfusion as their main reasons for preferring NIBTS to the hospital setting
  - 10% were not under any routine follow-up by a doctor
  - 54% were happy with current service and had no suggestions for improvement
  - 6% would like to see venesection permitted at community sessions
  - 13% would like to have their iron levels checked at NIBTS
- Plan to repeat questionnaire & audit programme next year following expansion to community sessions and facility to take and review iron profiles.

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