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“TSats what we like to see” – a Haemochromatosis Audit

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Introduction

Hereditary Haemochromatosis is an inherited disorder resulting from an inborn error of iron metabolism, which leads to progressive iron loading of parenchymal cells in the liver, pancreas and heart. In its fully developed stage, organ structure and function are impaired.[1]
It is the most common genetically inherited condition in Caucasians, especially those of Celtic descent[2].

Hereditary Haemochromatosis most often occurs by mutations to the HFE gene on Chromosome 6. The three most common genotypes are; Homozygosity for C282Y mutation, Homozygosity for H63D mutation, or ‘Compound Heterozygosity’- containing a single mutated allele of each.

Aim

1. To **compare** current treatment standards in our hospital to the ‘Clinical Guidelines’[3] released by the Hepatology Department at Beaumont Hospital in June 2019.

Methods

- A retrospective review was carried out of the charts of all 126 patients labelled as having Haemochromatosis, attending a Model 2 hospital in Limerick for treatment over a period of 3 months in early 2020.
- Results of genetic testing were retrieved.
- Exclusion criteria were:
  1) Patients heterozygous for C282Y mutation; and
  2) Patients undergoing monitoring due to family history or clinical features of HH, but without formal genetic testing.
- Blood tests, Ultrasonography and Echocardiograms were evaluated, as well as patient co-morbidities and any documented complications of HH.
- This information was then compared to guidelines released by Beaumont Hospital Hepatology Department July 2019.

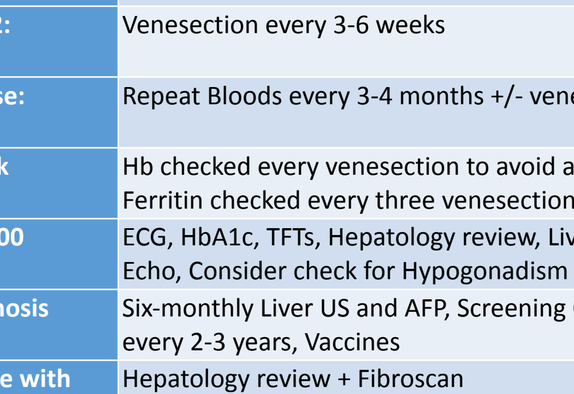
Guidelines

Parameter (Ferritin in ng/mL)	Guideline
1. Reduction Phase 1: (Ferritin >300 Males >200 Females)	Venesection every 1-2 weeks
2. Reduction Phase 2: (Ferritin 100-200)	Venesection every 3-6 weeks
3. Maintenance Phase: (Ferritin ~100)	Repeat Bloods every 3-4 months +/- venesection as required
4. Hb + Ferritin Check	Hb checked every venesection to avoid anaemia. Ferritin checked every three venesections
5. Initial Ferritin >1000	ECG, HbA1c, TFTs, Hepatology review, Liver US, Consider Echo, Consider check for Hypogonadism
6. Patients with Cirrhosis	Six-monthly Liver US and AFP, Screening OGD for Varices every 2-3 years, Vaccines
7. C282Y Homozygote with Age >40, SF>1000, Abnormal ALT and confounder	Hepatology review + Fibroscan

Results

- The charts of 126 patients labelled as having Haemochromatosis were reviewed
- 48 Patients were excluded from the study - Genetic Testing Data was unavailable for 36 patients, 7 carried single alleles of the C282Y mutation and 5 were carriers only of H63D.

- Of the 78 patients with genetic testing available confirming Hereditary Haemochromatosis, 60 (77%) were found to be Homozygotes for C282Y mutation , 5 (6%) were Homozygous for H63D, and 13 (17%) were Compound Heterozygotes.

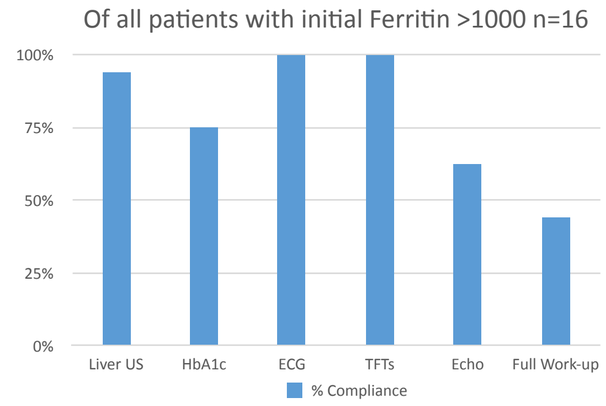


- On measuring the average of the most recent serum Ferritin levels, of all patients n=78, 39 (50%) were in the Maintenance Phase of treatment, 30 patients (39.5%) were in Reduction Phase 2 with average recent Ferritin <300, and 9 patients (11.5%), were in Reduction Phase 1, maintaining Ferritin >300.

Results

	Reduction Phase 1 (Ferritin >300)	Reduction Phase 2 (Ferritin <300)	Maintinence Phase (Ferritin ~ 100)
Homozygous C282Y	9	23	28
Homozygous H63D	0	1	4
Compound Heterozygous	0	6	7
Total	9 (11.5%)	30 (39.5%)	39 (50%)

- Of all patients with initial Serum Ferritin >1000 (n=16), 15(94%) had specified Abdominal Ultrasound, 12(75%) had HbA1c levels, 16(100%) had TFTs and ECGs on record, but only 10(62.5%) had Echocardiograms. This put total compliance with guidelines at 44% (n=7).



- Only a single patient was found to have a diagnosis of Liver Cirrhosis in the patient sample group. This individual did not have 6 monthly AFPs on our system, nor did he have twice yearly Liver Ultrasonography. Data for Endoscopy and Vaccinations were not available in the patient chart nor on the electronic patient record.

Discussion

Fifty percent of patients were found to be in the maintenance phase of treatment, which would be indicative of good disease control.

A minority (11.5%) of patients remained in Reduction Phase 1 (Ferritin >300), however, some of these patients had persistently raised Serum Ferritin levels over many months, without repeat laboratory testing. It appears that the recommended 1-2 weekly venesection is not occurring for these patients, putting them at higher risk of sequelae of disease, including end-organ damage.

A larger subset of patients (39.5%) remained in Reduction Phase 2. (Ferritin 100-300) but were not receiving therapeutic venesection 3-6 weekly, reflecting suboptimal therapy.

Several patients in Iron Reduction Phase 1 and Reduction Phase 2 had previously demonstrated a higher level of control. Of note, data collection spanned the first surge of cases of COVID-19, which impacted patients’ access to outpatient services.

Of concern to the audit team was the number of patients on the Haemochromatosis patient list, who did not have Genetic Testing data available in their charts, or on the electronic laboratory system. There should be a renewed focus on clarification of genotyping is Genotyping to ensure the diagnosis is accurate, and other iron overload conditions are ruled out.

There was a number of patients on the Haemochromatosis patient list, who had not had bloods nor attended clinic for long periods of time. These may have changed their care provider, been discharged to the IBTS, or have been lost to follow up.

Overall we unveiled that a significant proportion of Haemochromatosis patients are falling short of treatment recommendations, and further effort is needed to optimise the health of this large subset of Irish society. The implementation of a dedicated, protocolised, Haemochromatosis clinic may assist int his endeavour.

Recommendations

1. Distribution of the HSE Haemochromatosis Patient information Booklet to all patients.
2. Staff education session.
3. Routine laboratory investigations: Hb every venesection, Ferritin every 3rd Venesection
5. Introduction of a new Patient Venesection record.
6. New single-page Venesection Treatment Pro-forma for Venesection Unit staff.

References

1. Adams P, Brissot P, Powell LW. EASL International Consensus Conference on Haemochromatosis. J.Hepatol. 2000 Sep;33(3):485-504.
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3. Clinical Guidelines, Nurse led Haemochromatosis Service St . Joseph ’ s Hospital / Beaumont Hepatology Unit, 2019.