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Clinical Paper

Impact of COVID 19 on red flag discussions for haematological malignancies within the Belfast trust

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Abstract

Introduction: During the COVID-19 pandemic, there have been suggestions that there will be a reduction in cancer diagnoses, causing a detrimental effect on patients[1]. We therefore conducted an analysis to assess if there has been a reduction in new haematological malignancy diagnoses within the Belfast Health and Social Care Trust (BHSCT).

Methods: We observed a significant decline in diagnostic tests used in the diagnosis of haematological malignancies. We therefore decided to analyse the impact of COVID-19 on the volume of tests performed to see if this impacted the number of new cases of haematological malignancies diagnosed. To ascertain the number of new diagnoses referred to Clinical Haematology we decided to analyse the number of new diagnoses discussed at the local Multidisciplinary Team Meetings (MDM) between March and June 2020 and compare this with the same period in 2019. In line with NICE guidelines[2] there has been no change to the referral pathway for patients with new haematological malignancy.

Results: Results show that there is no significant difference between the number of new malignant haematological diagnoses discussed during March to June 2020 and the same period in 2019. This confirms that the number of new diagnoses remains the same within the two time periods.

Conclusion: This analysis highlights that despite a reduction in primary and secondary care diagnostic blood tests, there is no difference in the number of new cases of haematological malignancies discussed at Haematology MDM throughout the first surge of the COVID-19 pandemic locally.

Introduction

During the COVID-19 pandemic in Spring 2020 there was major reconfiguration in primary and secondary care services within the Belfast Health and Social Care Trust (BHSCT)[3]. This led to a reduction in the number of face to face consultations with patients. As such, the number of samples processed by the laboratories was greatly reduced. Overall, (in both primary and secondary care) there was a 55% decrease in haematological samples processed within the BHSCT at the peak of the pandemic compared with the average weekly number pre COVID-19 pandemic.

Due to the reduction in patient consultations and diagnostic blood sampling, there have been suggestions that there has been a reduction in the number of patients with suspected cancers referred to hospital[1].

The objective for this analysis is to assess if the reduction in laboratory usage affected the number of new diagnoses seen by the Haematology team within the BHSCT during the COVID-19 pandemic.

Method

Data was gathered firstly by assessing the number of samples processed by the haematology lab from February 2020 to June 2020. It was then categorised into inpatient, outpatient or primary care samples.

As new patients are referred from many different specialties within primary and secondary care, and furthermore, not all patients receive treatment (either inpatient or outpatient), we decided to review the number of new patients discussed at the Haematology Multidisciplinary Team Meetings (MDM) in the Belfast City Hospital during March to June 2020 and compared this with the same period in 2019. By following NICE MDM guidelines[2] we felt that the MDM should best reflect the numbers of new patients diagnosed with a haematological malignancy.

Using the numbers of new diagnoses discussed in MDM we then divided these into different diagnostic groups and then use statistical analysis to see how COVID-19 has affected numbers.

Results

Lab usage:

During the five weeks prior to lockdown, the haematology laboratory in the Belfast Health and Social Care trust (BHSCT) was processing an average of 19980 samples per week. On the week Government COVID-19 restrictions commenced (week beginning 15/03/2020)[4] the number of samples dropped to 11017. The week the Government imposed a full lockdown (week beginning 23/03/2020) the

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number of samples processed was 9065 and by mid April (at the peak of COVID-19 cases) this number was 7872. We can see from graph 1 that the greatest reduction in samples was from primary care.

It is interesting to note that the week during which most confirmed COVID-19 cases were diagnosed (week beginning 12th April), corresponded to the week the fewest number of samples were processed[5]. This showed a 79% decrease in primary care samples within the haematology lab compared with a 42% decrease in inpatient and 64% decrease in hospital outpatient samples.

There has been a reduction in nearly all of the different types of haematology profiles tested. The most common blood sample processed by the haematology labs is the complete blood count (CBC). On average, the BHSCT labs are processing 15606 CBC samples per week. This number fell to 8615 on the first week of lockdown and plateaued at 6085 on the week beginning 12th April 2020 (the week with the highest number of new COVID-19 cases)[5].

Another test that is commonly used in haematology (but processed in the Biochemistry laboratory) for the diagnosis of plasma cell malignancy is free light chains (FLC)[6,7]. The average number of samples processed for FLC pre COVID was 313 and during COVID was 184. This is a 41% decrease in samples. However, we are unable to determine how many of these samples were for new patients and how many were performed for monitoring of known patients with a diagnosis of plasma cell disorders.

As many haematological conditions (both malignant and non-malignant) are routinely diagnosed using blood samples from symptomatic patients or diagnosed incidentally[8] when samples are being sent for another reason we therefore conducted further analysis to see how the reduction in samples has affected the number of new malignant diagnoses seen by the Haematology team.

The Haematology Multidisciplinary Team Meeting (MDM):

NICE guidelines state that all patients with a haematological malignancy, non-malignant bone marrow failure or lymphocyte and plasma cell proliferation of uncertain significance are discussed at the weekly MDM[2]. In accordance with NICE guidelines there are two MDMs occurring weekly. One is for leukaemia and myeloproliferative disorders and one for lymphoma and plasma cell disorders.

The trust recommendation for new patient discussions is as follows:

- All patients with a new diagnosis of lymphoma prior to treatment (or as soon as possible after starting treatment)
- All new plasma cell disorders excluding MGUS (only discussed if further investigations are required)
- All new diagnosis chronic lymphocytic leukaemia
- All new diagnosis acute leukaemia

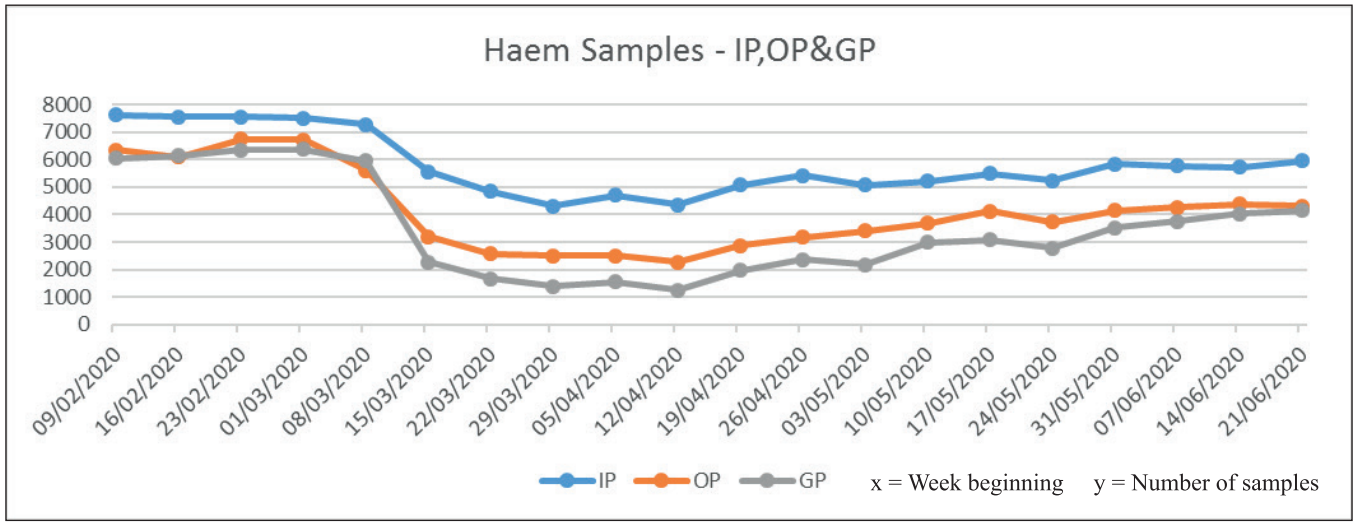
New Haematological diagnosis:

For this analysis, we compared the number of new patients and their diagnosis discussed at Haematology MDM in the Belfast City Hospital from March to June 2020 and the same period in 2019.

This shows that over both four month periods there are similar numbers of patients discussed. Table 1 shows the breakdown of the new cases discussed per month for each diagnostic category that were diagnosed through the laboratories within the BHSCT (any acute leukaemia that was initially diagnosed in another trust has been excluded).

From the data available, there was a mean of 22.5 patients per month discussed in 2019 compared with 20.5 per month in 2020. When the Monthly data was analysed by an unpaired t-test that showed a p value of 0.759. This shows no significant statistical difference between the two time periods. Even if we exclude the number of new lymphoma diagnoses

Graph 1



(IP- Inpatient sample; OP – Outpatient sample; GP – General Practice Sample)

Table 1:

Diagnosis	Mar-19	Apr-19	May-19	Jun-19	Total		Mar-20	Apr-20	May-20	Jun-20	Total
Plasma Cell	7	1	5	7	20		6	6	1	4	17
Lymphoma	13	3	7	4	27		8	7	5	14	34
CLL	5	1	3	2	11		1	3	0	6	10
Acute Leukaemia	1	0	4	4	9		2	0	4	1	7
Chronic leukaemia	1	1	3	3	8		1	0	1	1	3
MPN	3	1	2	3	9		3	0	2	0	5
MDS	0	1	2	2	5		1	0	0	3	4
Other	0	0	1	0	1		1	0	0	1	2
Total	33	10	30	29	102		26	17	16	32	91

(CLL – Chronic Lymphocytic Leukaemia; MPN – Myeloproliferative Neoplasms; MDS – Myelodysplastic Syndrome)

(as these are mainly diagnosed by biopsy rather than blood test) the p value is 0.407. Therefore, there is still no significant difference between the two timeframes.

Limitations

For the results, there is an assumption that all new patients are discussed in the local MDM, as there has been no change to the NICE guidelines or referral pathways/criteria over this time period. Within the BHSCT, not all new diagnosis MGUS patients are discussed at the MDM. As stated above, only MGUS patients requiring further investigations will be discussed but this policy is unchanged from previous years.

This analysis also does not take into account the actual diagnosis date therefore some patients may have been diagnosed before this period and discussion may have been delayed. Current Northern Ireland Department of Health guidelines state that all patients should have started treatment within 62 days of initial red flag referral and first definitive treatment should be started within 31 days of when the decision to treat was made[9].

We are unable to quantify how many of the free light chain blood tests were performed for new patients and how many were performed for monitoring patients with known diagnoses of plasma cell dyscrasias.

Lymphoma is mainly diagnosed using imaging and biopsy therefore are not generally reliant on blood tests for initial diagnosis.

Discussion:

Clinical Haematology is a specialty that diagnoses and treats a wide range of conditions that can affect the peripheral blood, bone marrow or even the lymphatic system. Each of these conditions presents differently and at different severities.

Patients are referred to the Haematology team from multiple different avenues such as primary care referrals, through the emergency department or from different hospital specialties. Therefore, the number of primary care referrals may not be an accurate representation of new patients diagnosed and treated. This is why, for this analysis, the number of new patients discussed at the MDM was used. As per NICE guidelines[2] all patients with a haematological malignancy or bone marrow failure disorder should be discussed at MDM. Therefore, it is felt that the number of MDM discussions should best reflect the number of new patients referred to Haematology.

The sharp decline in the number of samples processed by the labs within the BHSCT raised the question of how this may affect the number of new haematological conditions diagnosed as many of these affect the peripheral blood.

By comparing the number of new diagnoses discussed at MDM from the first week in March to the last week in June 2019 and 2020 there is no statistical difference between the two time frames. For this analysis, we only counted patients who were initially diagnosed within the BHSCT (this excludes patients with acute leukaemia who were initially referred from other trusts). This is reassuring as the initial fears were the COVID-19 pandemic would have a negative impact on patients and their diagnosis and management[10]. By following the criteria of the BHSCT MDM, the data suggests that there has been no reduction in the number of new referrals. This illustrates that there has been no change to the number of malignancies seen by the haematology team over this time period.

We can also see that there has been a reduction in the number of free light chain samples processed by the labs. However, despite this the number of plasma cell dyscrasias remains stable. This may reflect a reduction in monitoring samples sent due to a reduction in consultations. During this analysis, we were unable to determine how many of the FLC samples were for new patients. As not all new MGUS patients are discussed at MDM (and many are incidental diagnoses), it would be interesting to see whether there has been a reduction in this diagnosis[11].

This analysis has only looked at the number of newly diagnosed patients and how it compares to the same time period in 2019. During the COVID-19 pandemic, there have been some changes to certain treatment regimens as well as

patient criteria for treatment. Therefore, despite there being no change demonstrated in the number of new diagnoses, we have not analysed whether there has been a change in the number of patients commencing treatment or how this treatment may have differed pre-COVID[12]. As this analysis didn't look at the stage at presentation it will be interesting to see if the overall survival rate remains the same as previous years.

There are many haematological conditions, such as MPN and MDS, that may be diagnosed incidentally on blood tests that were performed for a different reason. Therefore, the long-term effect on these diagnoses will require monitoring over a longer period of time to ascertain the true effect COVID-19 has had[13].

Conclusions

Overall, during the COVID-19 pandemic there has been a major reduction in the number of samples processed by the haematology labs within the BHSCT. The area that has seen the biggest decrease in sample numbers is from primary care. However, despite this there has been a similar number of new patients discussed at the weekly Haematology MDM. The results have shown that there is no significant difference between the numbers discussed in 2019 and 2020. This is very reassuring considering the initial suggestion that there would be a reduction in the number of new cancer diagnoses.

We can see that the number of high grade conditions that may require immediate treatment has remained stable over the two timeframes. This analysis only considered diagnosis and not treatment. Due to COVID-19, there have been changes to some recommended treatments and consequently some patient groups may have been offered only lower intensity treatments to minimise their risk during the pandemic. Therefore, despite the same number of new diagnoses being made, the true long term effects of the COVID-19 pandemic will remain to be seen.

Conflict of Interest: No conflicts of interest to declare.

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