BMJ Open Gastroenterology

Outcomes of incoming and outgoing second opinions from a UK liver transplant centre

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To cite: Parente A, Boyd A, Mahgoub S, *et al*. Outcomes of incoming and outgoing second opinions from a UK liver transplant centre. *BMJ Open Gastro* 2022;**9**:e000987. doi:10.1136/bmjgast-2022-000987

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Received 8 July 2022
Accepted 30 August 2022

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ABSTRACT

Objective Second transplant centre opinions (STCOs) for patients declined for liver transplantation are infrequent. We aimed to identify STCOs outcomes from a tertiary transplant centre.

Design Referrals between 2012 and 2020 to Birmingham Unit were reviewed. Incoming: all referrals from out-of-region centres were collated. Outgoing: patients not listed in Birmingham were reviewed to identify referrals for STCOs to the other UK centres (A–F).

Results 2535 patients were assessed for liver transplantation during the study period. Incoming: among 1751 referrals, 23 STCOs (17 unit A, 3 unit B, 1 unit C, 1 unit D and 1 unit E) were provided by Birmingham. Of the STCOs, 13/23 (57%) patients remained unsuitable for transplantation. Therefore, 10/23 (43%) underwent a second liver transplant assessment, of whom five (50%) were still deemed unsuitable, three (30%) listed (one transplanted) and two (20%) died preassessment. Outgoing: among 426 patients not listed, eight (1.8%) patients were referred for STCO (4 unit E, 2 unit B, 1 unit D, 1 unit A). Three (38%) were listed, two (25%) were assessed and declined, two (25%) were unsuitable for assessment and one (12.5%) died while waiting. Combining incoming and outgoing Birmingham STCOs (n=31), six (19%) of STCOs were listed in a second centre.

Conclusion Second transplant centre opinions are rare with the majority still deemed unsuitable for liver transplantation. This highlights potential resource implications especially when undergoing a full second formal assessment. A streamlined STCO process with sharing of investigations and use of telemedicine in appropriate patients may allow for greater transparency, quicker decision making and less use of labour-intensive resources.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Second transplant centre opinions in the setting of liver transplantation are rarely sought with a lack of available data in this field regarding their outcomes or the process followed.

WHAT THIS STUDY ADDS

⇒ A large dataset in a tertiary referral liver transplant centre was reviewed, demonstrating that second transplant centre opinions represented only 1.3% of the overall assessment activity. Pooling incoming and outgoing referrals revealed that only 19% were deemed suitable to list for transplantation after a second liver transplant centre opinions.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Looking towards the future, a national second opinions liver transplant assessment database and streamlined cohesive assessment process between the seven UK centres may enable fair, standardised, timely and transparent decision making in the setting of liver transplantation.

INTRODUCTION

Liver transplantation (LT) remains the only curative option for patients with end-stage liver disease or fulminant acute liver failure whom hit transplant criteria. There remains a shortage of suitable grafts for the number of patients in need, and as such in the Eurotransplant region, waiting list mortality ranges from 8% to 26%.[1] Suitability for LT may be precluded by factors broadly divided into medical, anaesthesiology and surgical. Multidisciplinary team (MDT) input for LT includes that of nutritional assessment and psychosocial evaluations. In the UK, there are seven hospitals with adult LT units. Should a patient be declined for LT, the assessing centre usually refers the patient back to the primary referring physician for the continuation of care. In this setting, second transplant centre opinions (STCOs) are rarely considered, and their outcomes are not well documented. An LT centre not listing a patient may directly refer to another LT centre for STCO or recommend the referring clinician make a STCO elsewhere; the latter however may be at the discretion of the referring clinician after discussion with the patient. A STCO request also may be solely patient led. Transparency does not exist regarding reasons for/not for referring patients for STCO, or if the patient is referred for STCO their subsequent outcomes shared with the initial assessing

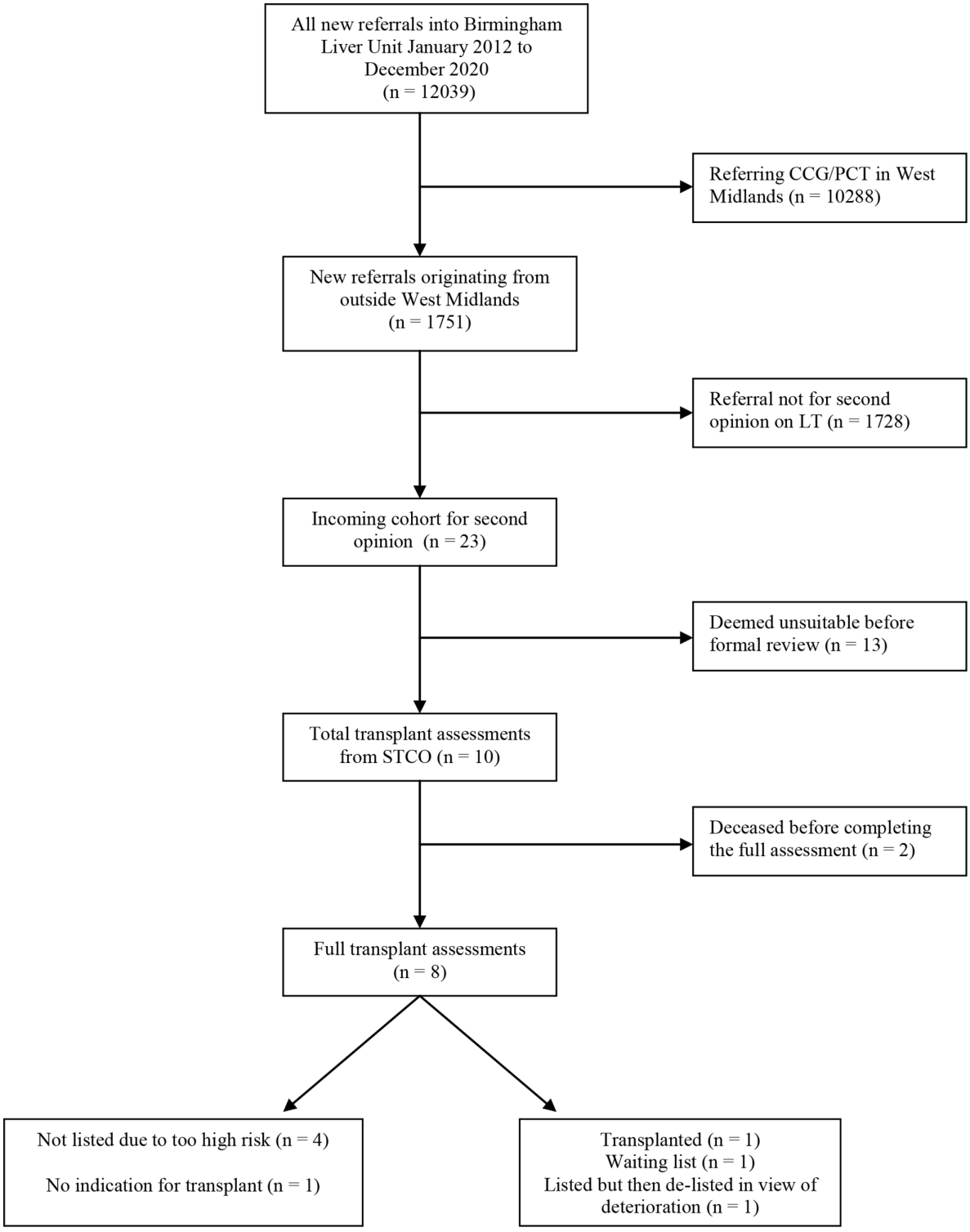

Figure 1 Flow diagram of the patient selection process for the 'Incoming' cohort. CCG, clinical commissioning groups; LT, liver transplantation; PCT, primary care trusts; STCO, second transplant centre opinion.

centre. With the onus generally placed on the referring gastroenterologist/hepatologist to explore STCO when care is devolved back to them, patients may incur time delays before STCO referral and STCO assessment. Palliative care referrals, in parallel, are considered in appropriate patients with a guarded prognosis unsuitable for LT.

This process by which STCO referral happens is not uniform or standardised. STCOs remain however important in other areas of medicine in cases of a diagnostic uncertainty, such as in the fields of radiology,[2] pathology[3] and oncology.[4] There remains a paucity of published data pertaining to the numbers of patients referred for LT STCOs and their outcomes or resource

implications. The aim of this study was to identify and describe outcomes of patients referred into a LT centre for STCOs and those referred out to a different LT centre for STCO.

MATERIAL AND METHODS

This represents a retrospective observational study by reviewing medical records at a single institution for which Strengthening the Reporting of Observational Studies in Epidemiology guidelines were followed.[5]

Incoming cohort

All adult patients (≥18 years old) receiving a new patient outpatient clinic appointment in the Birmingham LT Unit, Queen Elizabeth Hospital, Birmingham, UK between January 2012 and December 2020 from a prospective maintained dataset. Patients referred from the local West Midlands Clinical Commissioning Groups or primary care trusts were excluded (with the assumption these local regional hospitals would refer LT assessment patients to the Birmingham LT unit for primary transplant opinions). Only out-of-region LT referrals were interrogated. A retrospective review of electronic case records was undertaken by three independent researchers to identify patients being referred for an LT STCO, having been already assessed at one of the other six UK LT Centres (centres A–F). No referrals from out with the UK were included. Referral letters, ensuing correspondence, electronic charts and pathology reporting software were used to extract the relevant demographic and clinical data. Patients were not required to give informed consent to the study because the analysis used anonymous clinical data collected retrospectively. No external hospital LT databases/records were used in analysis (for incoming or outgoing patients).

Outgoing cohort

The Birmingham prospective LT assessment database was interrogated to identify patients who underwent an LT assessment in the same time period and who were not listed in our centre due to being 'too high risk'. Our centre's electronic records regarding their follow-up were reviewed pertaining to future STCO outcomes at one of the six other UK LT centres. As none of the other external six LT centre databases were used, an additional capture step was implemented, cross-checking our centre's non-listed patients with National Health Service (NHS) Blood and Transplant UK (NHSBT UK) to identify patients who may have been subsequently transplanted at another second LT centre. This additional step identified no additional cases. Patients declined in our centre for a reason of being 'too early' for transplantation were not included in the outgoing cohort.

Data reporting and statistical analysis

Numbers of patients are reported with an associated percentage rounded to the nearest integer (if applicable). Values are reported with median (range). Patient demographic variables were taken from the time of referral for the STCO. All analyses were performed using IBM SPSS V.25 (IBM Corp).

RESULTS

Patient demographics of STCOs

Incoming referrals

Overall, there were 12 039 new patient referrals to the Birmingham Liver Unit in the study period. Of all new patient referrals, 1751 (15%) were new referrals from out-of-region (ie, outwith West Midlands) UK hospitals. There were 23/1751 (1.3%) patients referred to Birmingham for STCOs regarding LT over the study period (figure 1). The primary LT centres were: LT unit A (n=17, 74%), LT unit B (n=3, 13%), LT unit C (n=1, 4%), LT unit D (n=1. 4%) and LT unit E (n=1, 4%). The median age of the cohort was 53 (range 27–72) years with 17/23 (74%) male (table 1). The most common aetiology of liver disease within the cohort was alcohol-related liver disease (ArLD) (n=15, 65%) followed by non-alcoholic steatohepatitis (NASH) (n=6, 26%), cryptogenic disease (n=1, 4%) and autoimmune hepatitis (n=1, 4%). The median United Kingdom End-Stage Liver Disease (UKELD) score at the time of review in Birmingham was 55 (range 46–67). The reason for initial LT refusal at the index centre included: high anaesthetic/medical risk in 12/23 patients (52%), alcohol relapse risk in 9/23 patients (39%), 'too early' for LT (n=1, 4%) and concerns about patient compliance with treatment (n=1, 4%).

Outgoing referrals

Some 2535 patients underwent LT assessment of whom 426 (16.8%) were not listed due to excessive risk (figure 2). Eight patients (five male (63%), median age 54 (range 31–69), median UKELD 50 (range 46–59) were referred to a second LT centre (table 2) after initial assessment in our centre. Four patients (50%) were referred to LT unit E with the remainder referred to the LT unit B (n=2, 25%), LT unit D (n=1, 12.5%) and LT unit A (n=1, 12.5%). The most common aetiology of liver disease within the cohort was NASH (n=2, 25%) and graft failure in patients with a previous LT (n=2, 25%). Other aetiologies included primary sclerosing cholangitis (PSC), Budd-Chiari syndrome, ArLD and portal vein thrombosis (n=1, 12.5%, respectively). Reasons for not being listed in our centre were high medical/anaesthetic risk in 6/8 patients (75%). This group included one patient specifically referred to another centre for consideration of veno-venous bypass during LT (unavailable at the time of assessment in our centre), and one patient was referred to a multivisceral transplantation centre (unit D) because of extensive splanchnic thrombosis caused by previous necrotising pancreatitis with subsequent portal biliopathy. Of the remaining two patients sent for STCO from our centre, one was declined listing due to alcohol relapse risk and one due to a recent diagnosis and resection of cholangiocarcinoma.

Table 1 Summary of the patient demographics and outcomes for the incoming and outgoing cohorts

Incoming				
LT unit (n)	Age (median and range (if applicable)) and disease (number, %)	Reason for initial centre not listing (number, %)	Outcome from second opinion (number, %)	If listed, outcome
A (n=17)	52 (27–66) ArLD (12, 71%) NASH (4, 24%) AIH (1, 5%)	Alcohol risk (5, 30%) Medical/anaesthetic risk (10, 59%) Other (2, 11%)	Not assessed (8, 47%) Discussion in principle, declined (3, 18%) Assessed, not listed (6, 35%)	N/A
B (n=3)	53 (36–66) ArLD (2, 66%) NAFLD (1, 33%)	Alcohol risk 2, (66%) Medical/anaesthetic risk (1, 33%)	Not assessed (2, 66%) Assessed, not listed (1, 33%)	N/A
C (n=1)	72 ArLD	Alcohol risk	Assessed, listed	Transplanted
D (n=1)	66 NASH	Medical/anaesthetic risk	Assessed, listed	Listed, subsequently removed
E (n=1)	43 ArLD	Alcohol risk	Assessed, listed	Awaiting LT

Data are reported with median and range for continuous variable, n and % for categorical variables.
AIH, autoimmune hepatitis; ArLD, alcoholic related liver disease; LT, liver transplantation; N/A, not available; NAFLD, non-alcoholic fatty liver disease; NASH, non-alcoholic steatohepatitis.

Outcomes of STCOs

Incoming referrals

Within the cohort, 10/23 (43%) patients for STCO had a formal LT assessment arranged (eight assessments performed). Of these 10 patients, 3/10 (30%) were listed (aetiologies ArLD n=2 and NASH n=1): one patient transplanted, one patient awaiting LT at time of data collection completion and one patient was subsequently delisted due to deterioration in clinical condition. Two patients (20%) died before the LT assessment could be completed. Of the 5/10 (50%) patients not listed following LT assessment, four (40%) patients were deemed too high risk in agreement with the original referring LT centre's outcome. One patient was deemed no longer have an indication for LT at time of assessment in our centre as no liver failure and/or evidence of portopulmonary hypertension were found. The main reasons for 'too high risk' in the four patients were cardiological (n=3) with impaired cardiopulmonary exercise test tolerance and myocardial perfusion scanning and in the other patient a combination of portal vein thrombosis together with atrial fibrillation and diabetes featuring end-organ damage.

Of the incoming referrals, 13/23 patients (57%) *did not* undergo formal LT assessment in our centre. Of these, 6/13 (46%) patients were assessed by the hepatology team in clinic and deemed unsuitable for LT assessment—in agreement with the index LT centre's outcome. Of the non-assessed cohort, 2/13 (15%) patients with ArLD demonstrated clinical improvement after prolonged abstinence and repeat LT assessment was deemed not necessary. Three patients of 13 (23%) were 'discussed in principle' at the unit's listing meeting and deemed unsuitable to undergo a formal LT assessment. One patient was discharged back to the referring centre due to poor compliance with clinic appointments and one patient had developed an out-of-criteria hepatocellular carcinoma by the time of review in our centre. The median waiting time for the incoming cohort was 69 days (range 39–93) from referral for STCO to being seen in our clinic. From being seen at new patient clinic in our centre to completion of LT assessment (if performed), the median time was 42 days (range 25–172).

Outgoing referrals

Of outgoing referrals from our unit, 5/8 patients (63%) had a formal LT assessment in a second LT centre. Five patients (62.5%) were referred to a single second centre in LT unit E, 3/5 patients (60%) assessed (aetiologies NASH (n=2) and Budd-Chari syndrome (n=1)): one patient with NASH was subsequently transplanted and two patients remain on the waiting list at time of data interrogation. LT unit D and LT unit E assessed the remaining two patients (40%), who had graft failure and portal vein thrombosis as aetiologies, respectively. They were not listed following assessment as one deemed 'too high risk', and the other patient felt technically unsuitable for multivisceral transplantation. Of those sent away for STCOs, 3/8 (37.5%) patients did not undergo a formal LT assessment in the second LT centre (aetiologies graft failure n=1, ArLD n=1 and PSC n=1) as

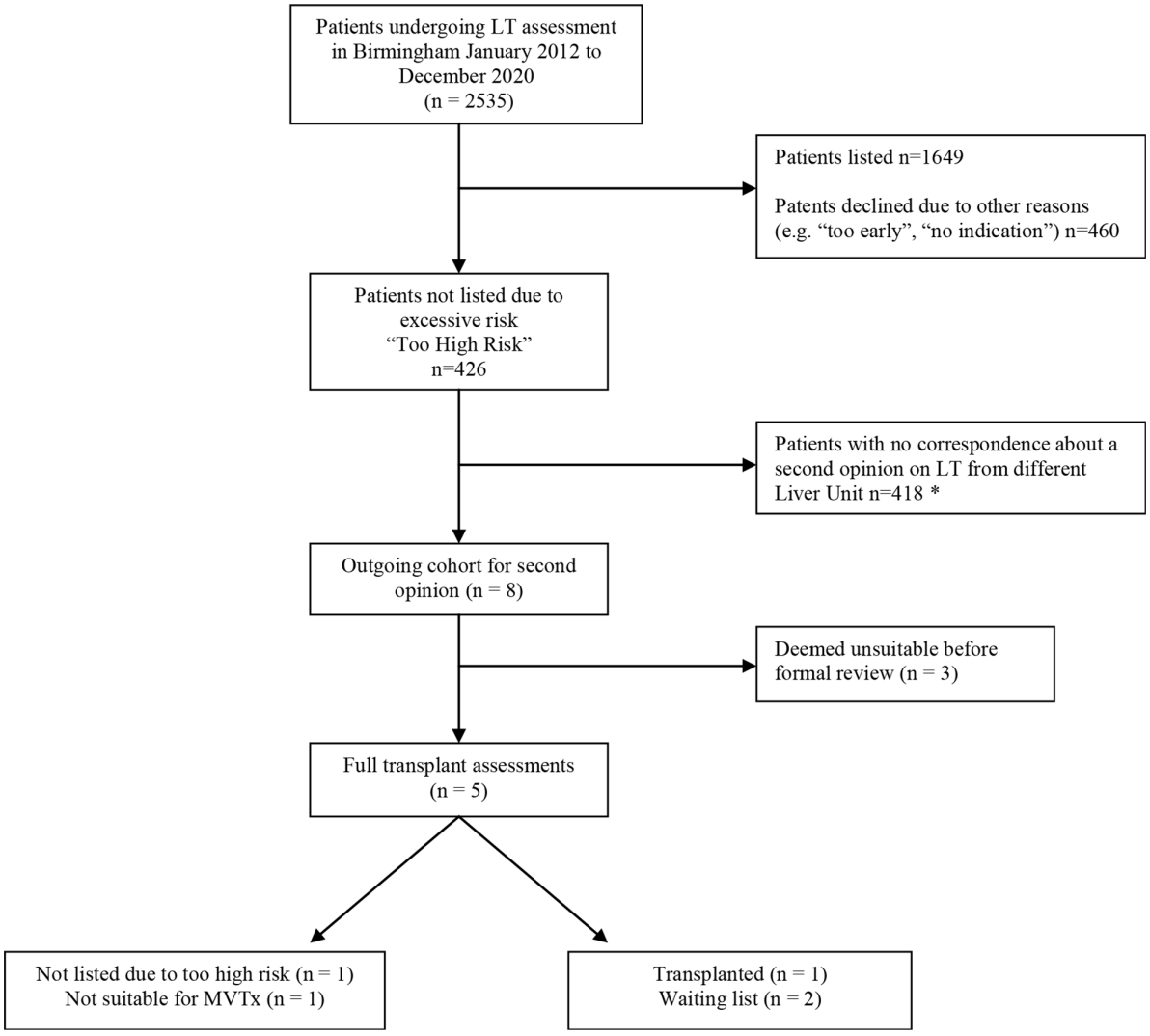

Figure 2 Flow diagram of the patient selection process for the 'Outgoing' cohort. *Includes cross reference check with NHSBT UK. LT, liver transplantation; MVTx, multivisceral transplantation; NHSBT UK, National Health Service Blood and Transplant UK.

there was agreement with the initial reason for LT unsuitability after clinic or virtual review.

STCOs as a proportion of the total LT activity

During the study period, 2535 patients underwent an LT assessment in our centre either as an inpatient (n=695, 27%) or outpatient (n=1840, 73%). Over the study period, of the 12 039 referrals, 2535 (21%) patients assessed, 1649 (13.7%) were listed and 1293 (10.7%) subsequently transplanted. Therefore, the 10/23 (43.4%) patients within the incoming STCO cohort undergoing a formal LT assessment represented <1% of total LT assessments in our centre. Overall, 426/2535 (16.8%) patients assessed in our centre identified as being 'too high risk' for listing for LT during the study period. Of these patients, only 8/426 (1.9%) were for outgoing STCOs, representing just under 2% of patients declined LT in our centre. The overall 426 declined patients had a median age of 59 (range 22–73). A palliative care referral was specifically mentioned/suggested on the outcome letter in 48/426 patients (11%). At the time of analysis, 233/426 (55%) patients were known to have died. Combining incoming and outgoing cohorts together who had a STCO involving our centre (n=31), repeat LT assessments were completed in 13/31 (42%) patients, and 6/31 (19%) patients were subsequently listed.

DISCUSSION

This study is the first to address the outcomes of second transplant centre opinions (STCOs) in candidates for LT. Over an 8-year period, STCOs remained a small proportion of LT assessment activity (1.3%), and questions are raised about future planning for such referrals and pathways. Our study highlights that over half (57%) of the incoming patients for STCO remain unsuitable for a full repeat LT assessment. When patients were not initially listed in our centre, only eight patients (2% of total not

Table 2 Summary of the patient demographics and outcomes for the incoming and outgoing cohorts

Outgoing				
LT unit (n)	Age (median and range (if applicable)) and disease (number, %)	Reason for initial centre not listing (number, %)	Outcome from second opinion (number, %)	If listed, outcome (number, %)
E (n=4)	48.5 (31–57) NAFLD (2, 50%) Graft failure (1, 25%) Budd-Chiari (1, 25%)	Medical/anaesthetic risk (4, 100%)	Assessed, listed (3, 75%) Assessed, not listed (1, 25%)	Transplanted (1, 33%) Awaiting LT (2, 66%)
B (n=2)	53 (37–69) PSC (1, 50%) Graft failure (1, 50%)	History of cancer (1, 50%) Medical/anaesthetic risk (1, 50%)	Not assessed (2, 100%)	N/A
D (n=1)	57 Portal vein thrombosis	Multivisceral transplant	Assessed, not listed	N/A
A (n=1)	56 ArLD	Alcohol risk	Discussion in principle, declined	N/A

Data are reported with median and range for continuous variable, n and % for categorical variables.
ArLD, alcohol-related liver disease; LT, liver transplantation; N/A, not available; NAFLD, non-alcoholic fatty liver disease; PSC, primary sclerosing cholangitis.

listed cohort) were referred for an STCO elsewhere. Of these, nearly 2/3 (62%) were not listed in another centre suggesting similar practice in LT centres. To extrapolate overall practice, pooling incoming and outgoing STCOs to/from our centre over the time period revealed only 19% were deemed suitable to list for LT in the second centre with the main reasons for initial unsuitability the risk of alcohol addiction/relapse and medical/anaesthetic (too high) risk. The question of resource utilisation thus to perform a full STCO second LT assessment may be raised.

In the UK, there are only seven adult LT Units serving the whole population. The comparatively small size of the country and intercentre geographical distance allows a unique situation whereby STCOs may be more feasible than in larger countries. Collaborative working between centres along with governing LT committees (The UK Liver Advisory Group – with pan-LT centre representation) allows, *where possible*, a degree of standardisation of care and assessment between units; however, there is not currently a uniform national LT assessment process. Collaborative inter-LT unit working was recently seen during the COVID-19 pandemic where a minority of waitlisted patients were transferred between the seven LT centres due to COVID-19 related capacity issues. UK LT centres also have a *hub-and-spoke* outreach model with referring centres facilitating incoming referrals but early repatriation following a transplant operation in rare cases. This allows care closer to home—a benefit for patients, especially when longer travels to LT centres involved. It has however been shown that despite the UK's size and only seven LT centres, disparities exist within the UK for accessibly and equity of care for LT depending on proximity to a transplant centre.[6] It remains an aim that all patients have equal and fair access to LT assessment—including STCOs—as close to home where possible. Monitoring of time delays (and outcomes) for STCOs, especially with the impact of COVID-19 pandemic, may be best served by an electronic national referral system or a unified national LT database tracking patient referral times, complemented by demographics, LT assessment details, waiting list events, LT details and the follow-up/outcomes and death. Such a database will allow transparency for patients and planning of resources moving forwards. This may serve as a platform for a linked-up STCO programme between centres. The volume of patients in the UK we hypothesise would not be large for STCOs as evidenced by our study; however, such a system may be more streamlined and by facilitating remote technologies, more equitable for patients and allow quicker decision making for STCOs. In our study, some adverse clinical events during the waiting time for the STCO occurred—a risk of decompensated cirrhosis. One patient within our cohort who developed advancement of hepatocellular carcinoma and one patient died prior to repeat LT assessment. This once again highlights the need for a streamlined STCO process and the importance of realistic communication with patients suffering from end-stage liver disease as to the fragility of their condition and a parallel palliative care referral if already declined by an index LT centre. Only 11% of patients had a palliative care referral documented in notes, leading to a change in our assessment process in 2016 introducing palliative care referrals as part of the listing meeting outcomes.

At present with increasing waiting times for patients in the COVID-19 pandemic era, along with perennial organ shortages, moves are also afoot to expand indications for LT. We hypothesise that the number of STCOs may escalate along with competition for grafts in the setting

of finite resources. A robust and collaborative system for patients along with good communication for patients not listed will be imperative. Also, the indications for LT are indeed evolving. Currently, in the UK, a pilot scheme is underway for LT in acute on chronic liver failure (ACLF), and there remain global calls for LT to be explored in acute alcoholic hepatitis (AAH) with European and US centres already transplanting for this indication.[7 8] LT for AAH remains contentious; thus, the role of STCOs may become more frequented if transplanting this indication becomes common practice in the UK. Patients with grave prognosis requiring consideration of LT for AAH or ACLF do not however have time to wait for STCOs by conventional outpatient referral pathways; thus, remote or virtual opinions/MDTs may be employed if asked for by patients. Our study showed that discussions of STCO cases *in principle* by the second centre often provided an outcome and may negate need for patient travel and also may be done in an expedient fashion. Having a standardised uniform inter-LT centre process for STCOs between units may be an area for exploration especially in the era of evolving LT indications and transplanting clinically sicker patients. The advent of telemedicine recently in the COVID-19 pandemic[9] also may be used for such patients with remote MDTs now embedded features of UK clinical practice. This may speed up referral times and timely decision making.

Second opinions (SOs) are well established in several field of medicine such as oncology.[4] For patients with a cancer, SOs can play an important role in the delivery of their care under multiple aspects, whether curative or palliative. In the oncological setting, Hillen *et al*[4] have reported in a systematic review that patient-driven SOs rates ranged from 1% to 88%. These were related to higher education, higher familiarity with the medical system, more social support and being non-religious.[4] Patients' primary reasons were mainly a perceived need for acquiring more certainty or confirmation, a lack of trust and dissatisfaction with the first specialist and/or a need for more information. Reported rates of diagnostic or therapeutic discrepancies between the first and SOs have in other studies ranged from 2% to 51%.[2 3] Already regional centres of excellence are established to discuss most cancers in the UK, giving matching or different opinions from local MDTs. Medical practice remains evidence based or based on guidelines; complex cases discussions can sometimes lead to professional-patient disagreement. In this setting, SOs can be effective in reassurance of both physician and patients,[10] especially when different teams (in different centres) come to similar treatment conclusions. Understandably, LT units might have different views regarding patients' risk factors, especially in the setting of medically/anaesthetically 'too high risk'. In addition, patients' perception and trust towards the assessing transplant physician or LT centre might differ. SOs can however be detrimental in certain circumstances as they may delay definitive decisions or patients' treatment, be duplicative in nature and costly. This time delay is critical in the setting of decompensated cirrhosis in patients with reduced lifespan.[11] The route of STCO may facilitate second centre expedient review, if STCO coming direct from the first centre LT team (34% of our incoming STCOs), rather than an incumbent delays asking a primary care physician or original referring physician to facilitate. A counterargument is that if patient declined first centre listing, having time to reflect and consider the outcome, along with discussion with referring physician who may have a long-established rapport with patient, is often in the patients' best interests. Such as reinforcement of initial centre outcome by local teams may explain the small number of STCOs encountered. Of the incoming STCOs to our unit, 34% were requested by the declining LT centre (the rest/majority requested by patient to assessing local physician in the LT centre to action or by the discretion of the assessing physician).

In our study within the incoming STCOs, 15/23 (65.2%) were *patient driven*, of whom three were added on our waiting list. Of these patients added, the LT indication was ArLD, and the reason for turning down from the first transplant centre was high risk of alcohol relapse/recidivism in all three cases. The patients were entered into a formal alcohol liver transplant MDT clinic engaging in modification and amelioration of their alcohol risk behaviour through work with the MDT team as recommended in current UK guidelines.[12] While there are ethical and financial considerations towards repeating LT assessments in all patients who have been declined LT at one unit due to alcohol risk, we have shown that significant improvements can occur in some patients with allowing them access towards LT.[13] In the outgoing cohort, 3/8 STCOs (indications: ArLD, chronic liver graft rejection and NASH) were patient driven. Of these, only one was added on the waiting list and transplanted (indication: NASH). The other five patients were referred for a STCO by the transplant physicians directly from our unit to another LT centre and of these two were added on the waiting list. Whether STCOs should be mandatory for NHSBT could raise logistical and geographical issues. Also a mention of STCOs could be considered in the information that patients receive in the first centre assessment, without detracting the focus negatively from the initial MDT assessment. The most optimal strategy and pathway for this remains to be further evaluated.

Our study had a number of strengths, including tracking all seven LT centres in the UK. The relative small size of the UK and only seven centres with collegiate working lent to a robust view of activity incoming and outgoing from our centre and by default from other centres too. This could be complemented by a pan-UK national collaboration. To the best of our knowledge, the current study represented the first of its kind as outcomes of second opinions for LT have never been reported. The novel findings allows potentials for future planning of LT assessments between centres and also tracking of outcomes in a more patient-centric and transparent way. Some limitations exist, first the retrospective study design and potential selection bias. Although

cross-checking with the national NHSBT UK data failed to identify additional STCOs patients who were transplant patients, we acknowledge that some of them still may have gone to second centre, been assessed but not listed. Having a national aligned data capture mechanism for STCOs would allow this to be monitored. However, there may have been some patients who received a STCO that we were unaware of. Moreover, our data may not be generalisable to other countries where different aetiologies for transplant dictate and different assessment processes. A major short-falling identified from this study was the documented recommendation for palliative care referral to local physician in 11% of cases. The listing meeting data collection MDT presentation since 2016 has included a specific outcome on MDT mentioning palliative care referral recommendation to local referring physician to improve on this figure in those patients not listed. Practically, when patient is contacted regarding not being listed, it is not common practice to discuss palliative care referral by telephone; a patient may be pre-emptively warned during the LT assessment regarding this, however, as part of a parallel strategy, or seen after LT assessment in a clinic. Patients are informed verbally of outcomes from our listing meeting and not formally by letter (a letter goes to referring physician). The modality of informing patients of transplant MDT discussions and outcomes is an avenue for exploration. In our centre, patients are informed by a coordinator/physician at the end of the assessment process with a formal letter to referring physician and general practitioner. Utilisation of patient and public involvement groups may aid with standardising the best format for communication outcomes in this setting between LT units. The utilisation of face-to-face clinic discussions of outcomes should not be underestimated where possible and if geography allows.

CONCLUSION

In conclusion, in this study we observed that requests for STCOs for LT in the UK are rare. There is a substantial disparity between the numbers of patients declined LT within our unit and the number of STCOs sought. There are however a group of patients that do get listed following STCO; thus, further work is required to understand the reasons for this and to identify patients that can benefit from STCOs. Equity for a STCO remains important in appropriate patients; however, identifying these patients needs robust mechanisms and processes/pathways with perhaps a standardised format. Utilisation of remote reviews or discussions in principle armed with first centre investigations in the first instance may facilitate STCOs in a timely fashion. Further research on this topic interrogating national databases within and outside the UK would be encouraged in order to better understand the patients who will benefit from STCO. This would better serve the international transplant community of the issues related to STCOs. Looking towards the future, a national STCO LT assessment database with outcomes of referrals may enable fair, standardised, timely and transparent decision making in the setting of second LT opinions.

Acknowledgements The authors would like to express their gratitude to Lisa Mumford and Sam Start from National Health Service Blood and Transplant UK (NHSBT) for their invaluable support in the research for this manuscript.

Contributors Conceptualisation: AP, AB and NR. Study design: AP, AB and NR. Data curation and collection: AP, AB, SMa and SMo. Formal analysis and interpretation: AP, AB, SMa, SMo and NR. Methodology: AP, AB and NR. Project administration: AP, AB and NR. Writing – original draft: AP, AB and NR. Writing – review and editing: all authors revised and approved the final manuscript. Guarantors of the article: AP, AB and NR.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not applicable.

Ethics approval The study was registered and approved by the local audit committee in the Queen Elizabeth Hospital, Birmingham UK (CARMS no. 15914).

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available on reasonable request.

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