



Evaluation of an endocrinology tele-medicine service during COVID-19

Abstract

The COVID-19 pandemic has brought exceptional challenges to health care providers across the globe requiring urgent alternative models of care to minimise interruptions to routine service. In this context orthodox practice of clinical endocrinology based upon face to face consultation, was converted to telemedicine. A rapid evaluation of this service was conducted to assess future utility in the post-pandemic period. Outcomes showed the majority of patients and clinicians were satisfied with telemedicine appointments and there was a reduced non-attendance rate when compared to a comparable pre-COVID face to face appointment cohort. Telemedicine was deemed appropriate for a sizable proportion of follow up visits, particularly for pituitary and thyroid disease. These findings favour an important role for telemedicine in future models of endocrinology outpatient care.

Keywords: COVID-19, endocrine outpatient services, telemedicine, clinician satisfaction, patient satisfaction

Introduction

The COVID-19 has created unprecedented challenges to health care; requiring urgent mobilization of acute services whilst trying to keep some semblances of routine care functioning. The universal challenges met by all specialty services were to comply with social distancing guidelines whilst continuing to deliver services with reduced manpower due to staff redeployment, shielding and sickness. Many specialties adapted services rapidly, with continued review of urgent patients and modified routine appointments to prevent the inevitable backlog when 'normal' services resumed. A key adaptation of our and many other endocrinology departments was the conversion of all appointments to Telemedicine (TM) to reduce patient footfall to the hospital and enable clinicians to work from home as far as possible.

Evidence of successful implementation of TM during the COVID19 pandemic is available from various specialties including orthopaedics, neurosurgery, oncology and adolescent services [1-4]. It is recognised as effective, feasible and well-received by patients and physicians alike. TM seemed unlikely to be useful prior to pandemic times in say, orthopaedics and neurosurgery where many management decisions

seemed dependent on clinical examination; however, it still had a role. Similarly, TM was successfully used in oncology and adolescent services despite these specialties often requiring lengthy communication, perhaps more suited to Face To Face (FF) consultation.

This study aimed to provide a rapid service evaluation of the TM service instituted during the height of the COVID-19 pandemic at our department to inform future plans for remodeling of endocrinology services post COVID-19.

Methods

■ Setting

This prospective questionnaire based survey was completed by eight clinicians (4 consultants and 4 specialty registrars) who each did a minimum of four TM general endocrinology clinics during the month of June 2020.

■ Questionnaire

The questionnaire assessed clinician and patient satisfaction with 9 questions and also evaluated factors and outcomes such as access to blood tests, non-attendance rates and ability to discharge from the service.

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■ Clinic booking

Appointments took place in pre-existing clinic lists in morning or afternoon slots as previously booked. A member of the admin team contacted each patient in the week before to remind of the TM appointment. All appointments were conducted as telephone consultations.

■ Patient cohort

Baseline patient clinical characteristics were collected on all patient contacts including the endocrine diagnosis.

■ Comparator cohorts within the department

Departmental clinic data base

The departmental clinic database is coded for 7 diagnostic categories (Pituitary; Adrenal; Thyroid; Reproductive; Calcium and bone; Neuroendocrine tumours; 'Other') and was analysed to identify the proportion of endocrine outpatients in each diagnostic category. This was compared with the TM cohort to ensure the TM cohort was representative of our outpatient practice.

Pre-COVID Face to Face (FF) appointment cohort

To allow comparison to the pre-COVID service, retrospective Data on baseline clinical characteristics, diagnostic categories, discharge rates and non-attendance rates were collected for 4 general endocrinology clinic lists per clinician from January 2020. These lists were conducted by the same 8 clinicians.

■ Statistics

Descriptive statistics were used to present data and IBM SPSS Statistics for Windows, Version 17.0 (IBM Corp., Armonk, N.Y., USA) statistical software package was used for data analysis.

Results

■ Baseline characteristics

The TM cohort consisted of 402 patients Males (M)-160 (39.8%), Females (F)-240 (59.7%), missing data 2 (0.5%), with mean age 50.06 years (SD 19.97 years). The majority 302/402 (75.1%) of the sample were Follow up (FU) patients. The pre-COVID FF cohort was

composed of 264 patients M-92 (34.8%), F-172 (65.2%) with mean age 50.16 years (SD 17.96 years). The majority 186/264 (70.5%) were FU patients similar to the TM cohort (TABLE 1).

TABLE 1. Base line characteristics of TM and Face to face cohorts (TM: Telemedicine).

	TM cohort	Pre-COVID Face to face cohort
Males	160 (39.8%)	92 (34.8%)
Females	240 (59.7%)	172 (65.2%)
Median age	49 years (Range 15-90 years)	50.5 years (Range 17-89 years)
New patients	99 (24.6%)	78 (29.5%)
Follow up patients	302 (75.1%)	186 (70.5%)
Total	402	264

Recent investigations were unavailable to review for 70.4% TM patient encounters and clinicians requested blood tests to be done in primary care for 48% of patients. Ninety two of the 402 patients (22.9%) were asked to attend the endocrine department for blood tests after the TM consultation.

With regard to diagnostic categories, almost half of the TM patients had pituitary (27%) or thyroid disorders (22%). The diagnostic category spread was similar to the endocrine clinic database (N=3346 patients) confirming the TM cohort is representative of the out-patient activity in the endocrinology department. FIGURE 1).

■ Patient and clinician satisfaction with TM

The majority of patients [322/402 (80%)] were satisfied with a TM consultation, while 11% (44/402) were dissatisfied. The main reason cited by patients for FF preference was being 'more comfortable with face to face discussion' (TABLE 2).

Clinicians were satisfied with TM for 63% [254/402] of appointments, though this is more pronounced in FU patients (70.5%). Clinicians reported not being satisfied with TM consultations for over half of new patients [51/99 (51.5%)] (TABLE 3). Difficulty to perform clinical examination [74/132 (56%)] was the highest cited reason for physician dissatisfaction followed by unavailability of investigations to review tests [22/132 (16.6%)] and communication difficulties [15/132 (11.3%)]. Endocrine conditions of the pituitary (25%) or thyroid (25%) were the most

FIGURE 1. Diagnostic categories (a) Endocrinology clinic data base; (b) TM cohort; and (c) pre-COVID FF cohort (TM: Telemedicine; FF: Face to Face).

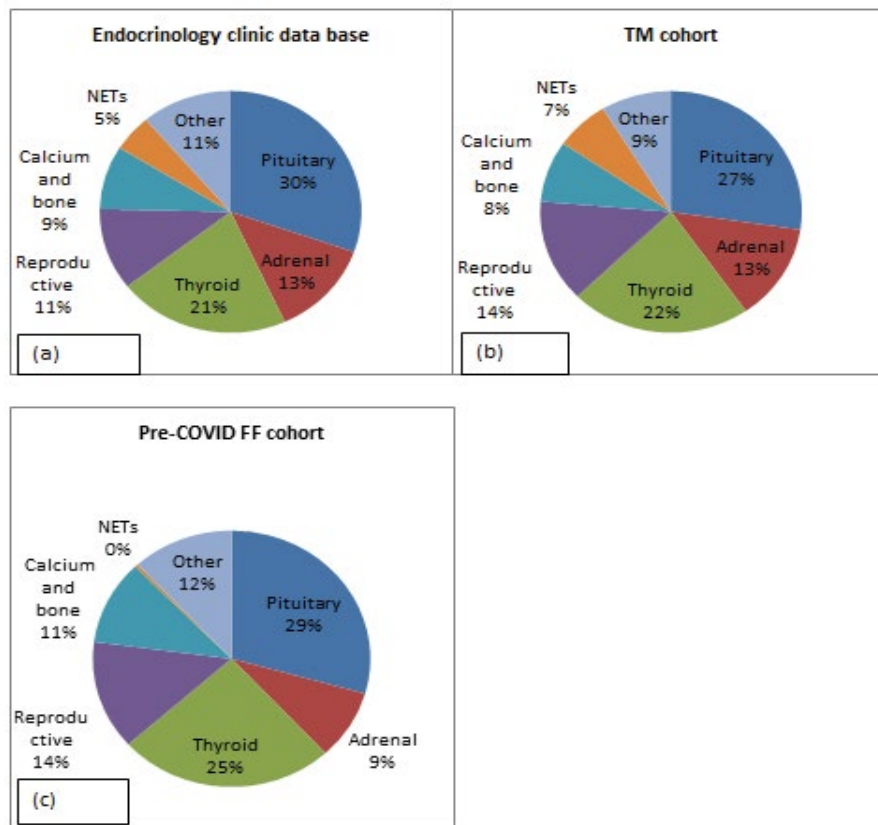


TABLE 2. Patient’s satisfaction regarding TM consultation.

Category	Follow up	New	Total
Patients satisfied with TM consultation	251 (82.8%)	71 (71.7%)	322 (80%)
Patients not-satisfied with TM consultation	30 (9.9%)	14 (14.1%)	44 (11%)
Patient satisfaction status unknown	9 (3%)	2 (2%)	11 (3%)
Missing data	13 (4.3%)	12 (12.1%)	25 (6%)
Reasons for patient dissatisfaction (44/402)			
communication problems	4 (9.0%)	1 (2.27%)	5 (11.3%)
more comfortable with FF discussion	20 (45.4%)	5 (11.3%)	25 (56.8%)
prefer to get blood tests from OCDEM	2 (4.54%)	2 (4.54%)	4 (9.0%)
Reason for dissatisfaction is not recorded	4 (9.0%)	6 (13.6%)	10 (22.7%)
Total	30 (68.1%)	14 (31.8%)	44 (100%)

TM: Telemedicine; FF: Face to Face; OCDEM: Oxford Centre for Diabetes, Endocrinology and Metabolism

TABLE 3. Clinician’s satisfaction regarding TM consultation.

Category	Follow up	New	Total
Satisfied with TM consultation	213 (70.5%)	40 (40.4%)	254 (63.1%)
Not-satisfied with TM consultation	81 (26.8%)	51 (51.5%)	132 (32.8%)
Missing data	8 (2.6%)	8(8.1%)	16 (3.9%)
Reasons for clinician dissatisfaction			
Breaking bad news	6 (4.5%)	0 (0%)	6 (4.5%)
Communication difficulties	11 (8.3%)	4 (3%)	15 (11.3%)
Difficult to build rapport	4 (3%)	1 (0.7%)	5 (3.7%)
Difficult to perform proper clinical assessment	37 (28%)	37 (28%)	74 (56.0%)
Moved from the area	1 (0.7%)	0 (0%)	1 (0.7%)
Need investigation results	19 (14.3%)	3 (2.2%)	22 (16.6%)
New treatment initiation	0 (0%)	1 (0.7%)	1 (0.7%)
Transition patients need to meet the team	1 (0.7%)	4 (3%)	5 (3.7%)
Reason for dissatisfaction not recorded	2 (1.5%)	1 (0.7%)	3 (2.2%)
Total	81 (61.3%)	51 (38.6%)	132 (99.4%)

common diagnoses when clinicians deemed TM consultation satisfactory.

■ Clinic outcomes

Clinicians reported 162/402 (40.3%) patients appropriate for TM follow up (rather than FF) at the end of TM appointments. In comparison to pre-COVID FF cohort, non-attendance rates were significantly lower in the TM cohort [15/402 (3.7%) vs. 25/264 (9.5%), $p=0.004$] while there was no significant difference in discharge rates [68/402 (16.9%) vs. 47/264 (17.8%); $p=0.843$].

Discussion

Until recent times, TM was predominantly used in rural medical care services where distance to quality medical care was a recognised barrier to health care delivery [5]. During the COVID-19 pandemic, TM proved to be a successful model of care and was rapidly put into practice by many endocrine departments in the UK.

Our study shows the majority of patients (80%) and clinicians (63%) were satisfied with the TM-endocrine service confirming it as a viable alternative to traditional FF consultation. Findings of a similar survey in sports medicine [6] showed significantly high patient (95.0%) and clinician (92%) satisfaction with TM and a sizable majority of patient (80%) from a rare cancer unit study preferred at least some future appointments to be TM [3].

Patients' most commonly reported reason for dissatisfaction with TM was 'would feel more comfortable with FF discussion'. There are obvious benefits to FF interaction: better opportunities to establish rapport, sensitive communication of worrying results, advantages of non-verbal cues and communication. This may be an area where video consultation has an increasing role to give the benefit of a more personal interaction.

Inability to perform clinical examination was our top cited (56%) reason for clinician dissatisfaction, a limitation also reported by others [4]. Video provides a possible alternative: Alexander et al. successfully used video interfacing with common electronic medical record platforms as a virtual tool for clinical examination including standard wound and range-of-motion checks in an orthopedic service [1]. Similarly, effective video neurologic examinations and TM services are already

established in tele-stroke care with benefits including shorter duration of hospital stay, rapid access to rehabilitation assessments, diagnostic testing and imaging when compared to standard stroke unit care [2].

Inability to access contemporaneous blood results is a common issue in TM and we found this a limiting factor in 70.4% TM appointments. This highlights the importance of developing better hub phlebotomy centres and having the IT infrastructure to overcome any limitation on investigations posed by not having a patient physically in the clinic. Following their TM appointment, 23% of our patients were asked to attend the department for lab tests which negates the key purpose of TM. Better triaging systems should identify where blood tests will affect clinic outcome and hence be arranged prior to TM.

Communication issues were cited in 11% of clinician dissatisfaction surveys and perhaps this is most relevant in 'breaking bad news' consultations as confirmed by the oncology clinic study where almost half (48%) preferred FF consultation [3]. Inability to maintain privacy and confidentiality during TM consultations was also a challenge experienced by care providers in the adolescent's clinic survey and to address this, they encouraged use of headphones, yes/no questions and the Zoom chat function [4]. Video consultation is also being increasingly utilised to better facilitate communication.

To assess the efficiency of TM service, we compared clinic outcomes of the TM cohort with the pre-COVID FF cohort. We predicted a possible reluctance to discharge patients post TM review, but we found this not to be the case. There was no significant difference in discharge rates between two cohorts. Additionally, non-attendance rate was found to be lower in the TM cohort in comparison to FF cohort. This is similar to published data in the sports medicine clinic with a 'no show rate' of only 2.8% [6]. This may be due to the fact that in our study the patient was alerted in the week before, confirming their TM appointment as well as the higher likelihood of contact via phoning the patient as opposed to expecting physical attendance. Thus similar discharge rates and lower non-attendance rates support TM as an efficient mode of care delivery.

Other published challenges associated with

TM are technology issues, requirements for training and need for guidelines on enhanced documentation, communication and information governance [5,7,8]. Since COVID-19, the RCP, GMC and medical defence organisations have published basic guidance on conducting TM consultations, highlighting key pitfalls [9].

We acknowledge our study limitations, which was conducted as a simple survey by clinicians delivering the TM. This could lead to bias as patients are more likely to give dissatisfaction feedback to an anonymised source. However, it was important to ascertain patient satisfaction at that stage in order to see if further TM follow-up was appropriate. Despite short timeframe, our TM sample was of a reasonable size and representative of the endocrinology out-patient service, making the data useful for future planning. By collecting data from multiple consultants and specialist registrars we limited the impact of individual practice or experience on study outcomes.

Conclusion

We find high patient and clinician satisfaction with the TM service instituted during the COVID-19 pandemic with lower non-attendance rate when compared to pre-COVID FF appointments, supporting incorporation of TM into longer term plans for outpatient Endocrinology. This practice could be nuanced by subcategorising patients better suited to

TM follow up (stable patients under long term follow up) versus those more appropriate for FF appointments (new patients or those where clinical examination needed). In a healthcare system increasingly using virtual and digital means of communication, we urgently require the inter-Trust IT infrastructure to enable systems to 'talk' to one another and maximise efficiency. As we contend with an impending second 'wave' of COVID-19, this data supports continued use of TM in endocrinology outpatient care as a practical, efficient and effective longer-term model.

Conflict of Interest

The authors declare that there is no conflict of interest.

Details of Author Contributions

B, supervised the Quality Improvement Project (QIP), A and B designed and implemented the QIP, A, analysed data and drafted the manuscript and both A and B contributed to the final version of the manuscript.

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