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BRIEF REPORT OPEN ACCESS

A National Audit of Current UK Practice on the Use of Anti-Emetics for Chemotherapy-Induced Nausea and Vomiting in Children

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ABSTRACT

This UK national audit aimed to assess adherence to evidence-based chemotherapy-induced nausea and vomiting (CINV) guidelines for children with cancer, which emphasise treatment emetogenicity assessment, symptom monitoring and appropriate antiemetic use. Data from 99 inpatient episodes in 12 centres were collected over 5 days in January 2024 via an anonymised survey. Concordance with 2018 CCLG guidelines was 83%, with 6% of cases overestimated and 11% underestimated levels of emetogenicity. This first UK national audit demonstrates generally good alignment with guidelines. Future audits should include prescribing practices in outpatient and ambulatory settings to provide a more comprehensive evaluation of CINV management.

1 | Introduction

Chemotherapy-induced nausea and vomiting (CINV) remains one of the most documented and distressing side-effects of anti-cancer therapy in children, potentially impacting compliance with future treatments if not managed correctly [1, 2]. It can negatively impact the quality of life, nutritional status and the ability for patients to tolerate further treatment, as well as potentially leading to anticipatory nausea and vomiting [3].

For adult cancer patients, providing CINV prophylaxis that is consistent with evidence-based clinical practice guidelines (CPGs) improves nausea and vomiting control [4, 5]. For children with cancer, the Pediatric Oncology Group of Ontario (POGO) developed CPGs for the prevention and management of CINV and breakthrough and refractory CINV [6, 7]. The CPG focuses on: (i) assessment of the emetogenicity of cancer treatment; (ii) regular assessment of CINV symptoms and (iii) appropriate prescribing of anti-emetics.

In the UK, the Children's Cancer and Leukaemia Group (CCLG) forms a national network of 20 principal treatment centres (PTC). The CCLG Supportive Care Group adapted the POGO CINV CPG for use in the UK, accounting for access and availability of different drugs.

A baseline audit of current UK practice of CINV management was devised to explore anti-emetic prescribing and adherence to the 2018 CCLG guidelines ahead of a planned guideline update in 2025.

Abbreviations: CCLG, Children's Cancer and Leukaemia Group; CINV, chemotherapy-induced nausea and vomiting; CNS, central nervous system; CPG, clinical practice guideline; POGO, Pediatric Oncology Group of Ontario; PTC, primary treatment centre.

2 | Methods

The CCLG Supportive Care Group designed questions to be answered from the audit. All inpatient chemotherapy administrations over a 5-day period (from 29 January 2024 to 02 February 2024) were eligible. Patients receiving outpatient or ambulatory treatment were excluded.

The audit was publicized to all CCLG members via e-mail newsletter. Each CCLG centre was invited to submit data via Qualtrics (Provo, UT) and it was completed by the patient's medical care team. Non-identifiable data were collected on patient demographics, chemotherapy regimens and anti-emetics administered. Centres reported their own assessment of chemotherapy emetogenicity to provide real-world data to reflect actual patient care. The study team assessed compliance with the CCLG CINV 2018 guidelines centrally by comparing each centre's reported chemotherapy regimens and emetogenicity classifications against the recommendations. Results were reported narratively and descriptive statistics were reported.

3 | Results

A total of 99 episodes from 12 centres were recorded over the 5-day audit period, 97 of which were analysed. The 12 centres that submitted data were geographically diverse, representing distinct areas across the UK, including England, Scotland and Wales, and encompassed a range of centre sizes, from small to large-volume institutions.

Two episodes were not included as they involved blinatumomab, which did not appear in the 2018 guidelines and could therefore not be classified. The median number of episodes/centres was 8 (range 3–19). The median age of patients was 8 years (IQR 4–13 years) with diagnoses of non-central nervous system (CNS) solid tumour (47/99, 47%), leukaemia (34/99, 34%), CNS tumour (13/99, 13%) and lymphoma (5/99, 5%).

The centre-reported emetogenicity of the 97 episodes that had a chemotherapy agent listed in the 2018 guidelines was: 46% highly emetogenic, 29% moderate, 18% low and 7% minimal.

Overall, concordance with the 2018 guidelines for emetogenicity classification was high at 83% with only 6% of episodes given a higher level of emetogenicity by the centre and 11% reported as a lower emetogenicity (Figure 1). Methotrexate at a dose of > 12 g/m^2 is classified as highly emetogenic but was reported as moderate in five episodes from four different centres.

As expected, a range of different agents were used depending on emetogenicity (Figure 2). Ondansetron was the most frequently scheduled/regular drug across all levels of emetogenicity (77% of all episodes) and the most frequently prescribed discharge medication (70%). For patients receiving highly emetogenic chemotherapy, 85% received ondansetron, 11% received granisetron and only 4% did not receive a 5-HT3 receptor antagonist. Ondansetron was also most frequently (70%) prescribed as a discharge medication across all levels of emetogenicity. There were 11 episodes of ifosfamide administration with 6/11 patients receiving concurrent aprepitant.

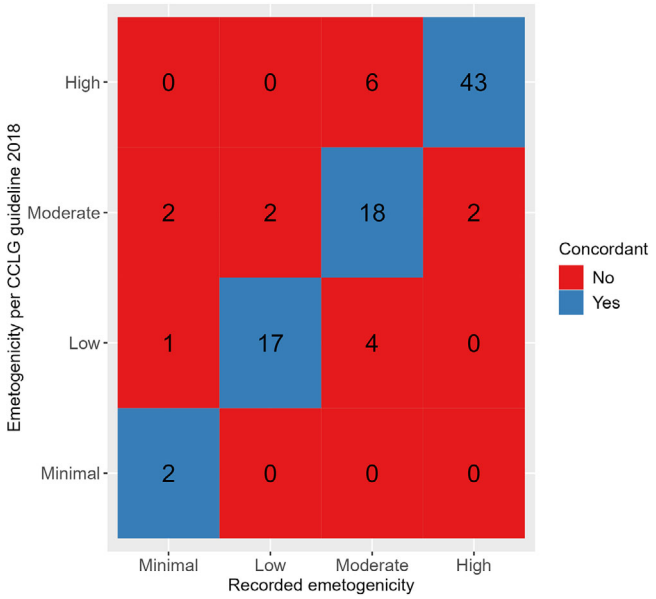

FIGURE 1 | Concordance of centre-reported emetogenicity with CCLG 2018 guidance emetogenicity by episode ($n = 97$).

4 | Discussion

This is the first national audit of CINV practice in the UK since the introduction of CCLG guidance in 2018. Over half of CCLG centres participated in the audit with high, medium and low volume centres all represented.

Adherence to CCLG guidelines with regard to emetogenicity classification of chemotherapy agents was overall very good (> 80%). This is much higher than other published studies of CINV guideline consistent care [8, 9]. However, methotrexate was misclassified most frequently, potentially reflecting dosing for different chemotherapy protocols (for example, 12 mg/m^2 for osteosarcoma and 5 mg/m^2 for acute lymphoblastic leukaemia).

The retrospective nature of this audit limits the assessment of emetogenicity classification, as this was reported by the data contributor, who may not have been the prescriber. A prospective dashboard assessment of prescribing practice would be a more accurate assessment of perceived emetogenicity.

However, the strength of evidence for these classifications is important to consider, as the lack of evidence surrounding the emetogenicity of chemotherapy agents can make it harder for providers to prescribe the most appropriate anti-emetic prophylaxis. A POGO CPG from 2019 [10] provides consensus guidance for acute CINV in chemotherapy-naïve patients but is limited due to the evidence-base that it is formed from. Historically, data was taken from adult studies and applied to paediatrics, but it is now known that additional factors will affect how much a paediatric patient may vomit with different chemotherapies [10]. Where evidence was lacking, the CPG overclassified agents, ensuring patients had their chances of CINV reduced as much as possible.

The appropriate prescribing of anti-emetics according to emetogenicity classification was challenging to assess accurately in this audit. Furthermore, individual patient prior experience and

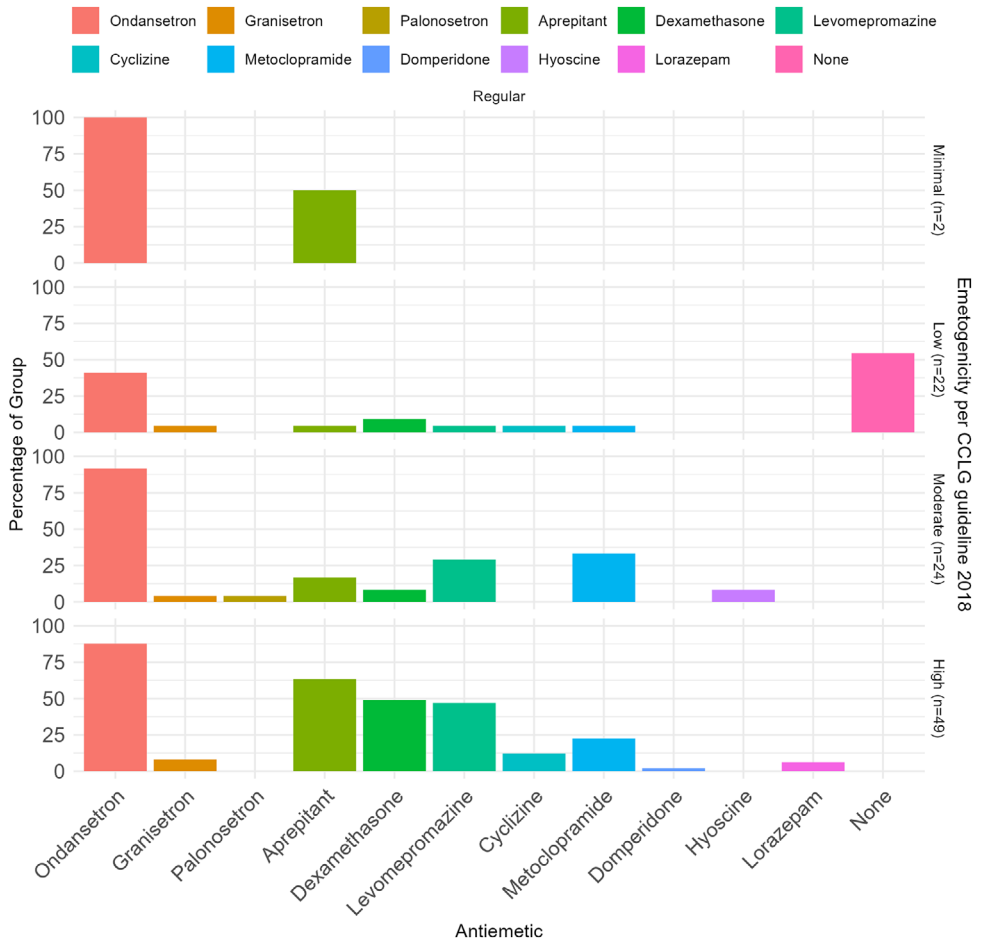

FIGURE 2 | Anti-emetic drugs administered as scheduled/regular medications, stratified by guideline classified emetogenicity ($n = 97$).

regular assessment of CINV symptoms will also influence the prescribing of anti-emetic agents. We were not able to collect this data as part of this audit.

Since 2017, aprepitant has been extended to children older than 6 months of age and is one of the integral drugs for anti-emetic prophylaxis for patients receiving highly emetogenic chemotherapy [11]. There is a theoretical risk of increasing ifosfamide-mediated neurotoxicity if aprepitant is given concurrently [12, 13]. This may account for its less than expected use in the highly emetogenic episodes captured. Of 11 patients receiving ifosfamide, six received regular aprepitant. The reasons for omitting aprepitant in these patients was not captured within our data set. Dexamethasone is recommended as an anti-emetic within the guideline but is considered contraindicated in patients with brain tumours or those receiving steroids as part of therapy such as for leukaemia.

Ondansetron was dispensed as a discharge medication for most patients (70%) in our audit which is now not recommended due to the poor evidence for its indication for delayed CINV [6]. However, the 2018 guideline was not explicit about the use of ondansetron for delayed CINV. This change in practice will be important to audit in the future.

Other similar studies of adherence to guidelines for CINV in paediatric patients have demonstrated identification of barriers to guideline adherence and implementation of interventions such as an educational session, addition of newer drugs to the formulary and flowsheets to aid prescribing [9, 14–16]. The 2025 CCLG CINV guideline based on the POGO update recommends use of newer agents such as palonosetron so it will be important to assess adherence to this updated version in the future.

This first national audit of CINV management for children with cancer in the United Kingdom will serve as an important baseline for future work to improve CPG-consistent care. Further audits will need to collect data for a longer period, address the patient perspective and previous experience of chemotherapy, breakthrough symptoms, and include patients receiving outpatient and ambulatory treatment.

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Conflicts of Interest

The authors declare no conflicts of interest.

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