Revised anti-emetic guidelines and the impact on nutritional status during induction chemotherapy in children with High Risk Neuroblastoma

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Introduction

High-Risk Neuroblastoma (HR NBL) treatment requires intensive induction chemotherapy.

The profoundly emetogenic agents used can result in compromised nutritional status.

Our institution introduced new anti-emetic guidelines in 2010 incorporating regular dexamethasone use, in addition to ondansetron, for all highly emetogenic protocols.

Objectives

To establish the impact of revised guidelines on emetic control, nutritional status and hospital admission frequency for febrile neutropenia (FN).

Methods

A retrospective comparative review of paediatric patients diagnosed with HR NBL who received rapid COJEC induction chemotherapy as per HR-SIOPEN NBL trial. Prophylactic anti-emetics were prescribed regardless of chemotherapy emetogenicity in Group A (2004-2010) but for defined time periods considering chemotherapy emetogenicity in Group B (2010-2017).

Results

Sixty-seven patients were diagnosed with HR-NBL between 2004 and 2017; of which 63 were eligible for inclusion in the review (median age 31 months, range 1-88 months).

	Group A	Group B
Time period	2004-2010	2010-2017
N	31	32
First-line prophylaxis nti-emetics	Ondansetron Metoclopramide <i>Prescribed regardless of emetogenicity</i>	Dexamethasone Ondansetron <i>Prescribed based on emetogenicity for defined time periods</i>
Sex - Female / Male	17 (55%) / 14 (45%)	17 (53%) / 15 (47%)
Age (months) Median (range)	31 (2-88)	31 (1-78)
Completed cycles	244	256

Group A had more episodes of emesis than Group B (189 versus 116, $P < 0.0001$) during induction.

Four children (13%) in Group A lost >10% body weight with; 0 in Group B. The children in Group B had a positive percentage weight change of +3% (range -7 to +28%) over induction versus a percentage weight loss of -4% (range -16 to +8%) for the children in Group A ($P = 0.0008$). There was a significant difference in Weight-for-Age Z score change between the groups ($P = 0.0027$).

Nutrition support (NS) was utilised by 29 children (94%) in Group A versus 21 children (66%) in Group B.

The median contribution from oral nutritional supplements and/or NS to daily estimated calorie requirements ranged from 70-89% in group A and 34-56% in group B and these differences reached statistical significance.

Results Cont'd

Group A had a median of 3 (range 1-7) admissions for FN versus a median of 2 (range 0-4) for Group B ($P = 0.018$).

Conclusions

The revised guidelines led to reduced emesis frequency for those in Group B.

They required less NS, were able to follow expected growth trajectories more closely and had fewer FN admissions.

We propose that this may be due to better emesis control resulting in improved nutritional status and associated enhanced immune function.

References

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