Standing on Pins and Needles? Patterns and Severity of Vincristine-Induced Peripheral Neuropathy in Children with Acute Lymphoblastic Leukemia

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BACKGROUND & SIGNIFICANCE
Vincristine-induced peripheral neuropathy (VIPN) occurs in nearly all children receiving vincristine (VCR) for acute lymphoblastic leukemia. ALL. Symptoms include numbness, tingling, and pain in the hands & feet. Few studies have described VIPN severity, patterns, and severity of the symptoms associated with increased risk for developing intractable problems. It is important to gain knowledge about VIPN patterns and severity because symptoms can be chronic and limiting in a highly curable patient population. Study findings may lead to future interventions to reduce VIPN-related long-term functional and quality of life impairments.

METHODS
PV scores for most children (blue and red clusters) and individual item scores did not significantly improve in months 8-12. Cluster analysis results suggest that some children are at a more risk than others for developing severe VIPN. Further research is ongoing to identify risk factors, early intervention criteria, or predicting high risk patients. Further research is ongoing to identify risk factors, early intervention criteria, or predicting high risk patients. Further research is ongoing to identify risk factors, early intervention criteria, or predicting high risk patients.

RESULTS

Aim 1: Describe VIPN incidence, patterns, and severity.
In the first year following diagnosis:
- 100% developed VIPN
- 100% developed painful VIPN
- Mean TNS-PV individual item scores were generally low for most children.
- Reflexes were affected most (mean SD = 1.63±0.5, range 0-4) and could be evaluated in nearly all (88.2%) children.
- TNS-PV scores for some patients (green cluster) peaked 4 months from diagnosis, approximately 2 months after reaching the maximum vincristine dose density, illustrating a coasting effect.
- TNS-PV scores for most children (red and blue clusters) peaked at month 6-7.

Aim 2: Describe the relationship between dose density and VIPN.

Aim 3: Describe the predictors of more severe VIPN.

VIPN Signs & Symptoms

• TNS-PV total (see Aim 1 graph) and individual item scores did not significantly improve in months 8-12 despite decreasing vincristine dose density over time.
• TNS-PV scores were positively associated with age (p = .0095) but not gender.
• Two to three distinct clusters emerged from the data revealing some children (n = 11) experienced severe VIPN unrelated to dose density.

REFERENCES
1. Chaudhry V, Ramchandren N, Cornblath DR. Peripheral neuropathy from neurotoxic agents, or to non- neurotoxic agents, or to non.

LIMITATIONS
- Study findings cannot be generalized to neuropathy caused by other malignancies, or to non-lymphoblastic populations.
- Interpretation of dose density and cluster analysis are qualitative.
- Early peak severity may be due to steroid myopathy.

CONCLUSIONS
All children developed VIPN and pain. Symptom severity was low in most cases. TNS-PV was most severe 4-7 months from the onset of ALL treatment and did not improve despite children receiving less vincristine in months 8-12. Cluster analysis results suggest that some children are at a more risk than others for developing severe VIPN. Further research is ongoing to identify a baseline clinical "signature" for identifying high risk patients.