신경근육재활 및 전기진단

게시일시 및 장소 : 10 월 18 일(금) 08:30-12:20 Room G(3F)

질의응답 일시 및 장소 : 10 월 18 일(금) 10:00-10:45 Room G(3F)

P 1-58

Quantitative analysis of Vincristine induced- peripheral neuropathy in children with ALL

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Objective

Motor problems of children with acute lymphoblastic leukemia(ALL) after vincristine administration are frequently reported. This is thought to be vicristine-induced neuropathy, which has dose-related, length-dependent and axonal pattern. In particular, the weakness of lower extremities is seemed more apparent in children than in adults. In this study, we analyzed vincristine induced peripheral neuropathy in children quantitatively.

Methods

Electrodiagnostic examinations were conducted in 32 children who had been treated with vincristine and showed signs of peripheral neuropathy.

Results

Electrodiagnostic examination showed an axonal neuropathy with a length-dependent pattern. Motor nerve abnormalities were observed in all 32 patients, and sensory neuropathy was accompanied in 12 of them(37.5%). The number of affected nerves was 3.31±0.85 (mean±SD) of four motor nerves, which was 0.78±1.18 in the sensory nerve. This difference between motor and sensory nerve was significant. Compared with pediatric reference value, the mean compound muscle action potential(CMAP) amplitude was 39.2±20.5% in the median nerve and 11.6±12.3% in the peroneal nerve. Meanwhile, sensory nerve action potential of sensory nerve amplitude was 107.0±52.9% in the median nerve and 133.3±68.2% in the superficial peroneal nerve. There was statistically significant difference between amplitude of the compound muscle action potential and sensory nerve action potential.

Conclusions

Vincristine is well known neurotoxic agent used for treatment of leukemia, lymphomas and cancers. Its main side effect is a dose-related, length-dependent axonal neuropathy. Especially, motor predominance has been reported in children. In this study, we

conducted electrodiagnostic examination and motor predominance neuropathy was shown due to incomplete myelination in children.

Table 1. Clinical characteristics of patients (N=32)

	Patients
n	32
Age(years)	8.5 ± 5.0
Sex, ratio(M:F)	18:14
Time interval between first VCR and EDx examination(days)	233.1 ± 265.3
Cumulative dose(mg/m^2)	19.1 ± 16.5
Motor neuropathy	32
Sensory neuropathy	12

VCR, vincristine; EDx, electrodiagnostic

Table 2. Involvement pattern of nerve in Vincristine induced peripheral neuropathy in childhood

Motor nerve	Number of involved nerve	Sensory nerve	Number of involved nerve	P-value
Median	29/32	Median	5/32	0.000*
Ulnar	26/32	Ulnar	2/32	0.000*
Peroneal	32/32	Superficial peroneal	6/32	0.000*
Tibial	19/32	Sural	12/32	0.066

ALL, Acute lymphobalstic leukemia

* p<0.05.

Table 3. Quantitative analysis of CMAP and SNAP amplitude in motor and sensory nerve in Vincristine induced peripheral neuropathy in childhood ALL

Motor nerve	CMAP amplitude (%)	Sensory nerve	SNAP amplitude (%)	P-value
Median	39.2±20.5	Median	107.0±52.9	0.001*
Ulnar	56.6±23.0	Ulnar	143.1±56.1	0.006*
Peroneal	11.6±12.3	Superficial peroneal	133.3±68.2	0.000*
Tibial	71.6±27.6	Sural	74.1±30.4	0.729

ALL, Acute lymphobalstic leukemia; CMAP, compound motor action potential; SNAP, sensory nerve action potential.

* p<0.05.