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Abstract

A Case of Peripheral Polyneuropathy Occurring in a Small Enterprise Processing Mobile Phone Cases

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Objectives: We report a case of n-hexane-induced occupational peripheral polyneuropathy. The patient had been cleaning mobile phone cases using n-hexane for 3 years without proper protection in the workplace.

Method: Physical examinations, detailed history taking, laboratory studies and electrophysiological study were done. The n-hexane concentration in the ambient air of the workplace was analysed.

Results: The findings of the electrophysiological study revealed that the worker's neurologic symptoms were due to peripheral polyneuropathy. The average n-hexane concentration in the ambient air sampled at the workplace for 59 minutes was 1411.24ppm, from which the 8 hour time-weighted-average(TWA) was estimated as 882ppm. Because other alternative causes for peripheral polyneuropathy were ruled out by laboratory findings and detailed history taking, this TWA level strongly suggested that the disease was caused by n-hexane exposure.

Conclusion: Although the neuro-toxicity of n-hexane is relatively well known, many problems have been identified in the management of this toxic material in terms of preventing toxic diseases in the workplace. We expect that this case will help in the planning of health management strategies for using n-hexane in the workplace.

Key Words: Polyneuropathy, Occupational neuropathy, Toxic neuropathy, n-Hexane

(distal)
(polyneuropathy) (Meriggioli,
2004; So, 2004).

(peripheral neuropathy)

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(n-hexane) 57 2004 1
 (가 10) (가)
 가 .
 가 1~2 ,
 (, 2004), 1974 (touch, heat sense, joint position sense)가
 225 ppm 655 ppm , (knee jerk)
 (ankle jerk)
 18 가
 2 , F
 (, 2004; 2004). F
 1980 ,
 (Table 1).
 가 , 1996 3 1998 1
 , 1998
 6 ()
 , 1999 2001
 가 2002 1 8 2004 11
 가 가
 ()

Table 1. Electrophysiological study

	Nerve	Latency (ms)	Amplitude (mV)	Velocity (m/s)	F-M Latency
MNCS	Lt. Peroneal	4.6/12.2 (3.7-5.3)	2.6*/2.3 (3.0-5.8)	37.5* (46.9-55.1)	49.7* (38.0-44.0)
	Tibial	4.0/14.0 (3.6-5.0)	9.6/6.8 (7.8-20.4)	40.8 (43.8-52.8)	43.2 (38.0-44.0)
	Median	3.5/7.7 (3.0-3.4)	4.4*/3.5 (8.2-18.2)	50.0 (52.9-60.5)	26.7* (18.0-24.0)
	Ulnar	3.0/6.8 (2.9-3.3)	8.4/7.0 (8.3-12.5)	54.7 (44.4-56.2)	25.2* (18.0-24.0)
SNCS	Lt. Peroneal	3.9* (3.1-3.5)	4.7* (5.0-15.0)	35.9* (40.0-45.1)	
	Sural	3.8* (2.9-3.5)	3.9* (6.0-18.0)	36.8* (40.0-48.3)	
	Median (wrist)	3.8* (3.0-3.4)	16.0 (10.0-90.0)	36.8* (41.2-46.7)	
	Median (mid-palm)	1.96* (1.4-1.8)	22.0 (10.0-90.0)	35.7* (38.9-46.7)	
	Ulnar	4.1* (2.7-3.3)	9.3 (15.0-50.0)	34.1* (42.4-51.9)	

MNCS, Motor nerve conduction study; SNCS, Sensory nerve conduction study

numbers in the brackets: reference range in the laboratory

*: abnormal data

92(mg/dL)
 (T3: 90.1ng/dL,
 free T4: 1.04 ng/dL, TSH: 0.741 uIU/mL)
 (total cholesterol: 158 mg/dL, triglyc-
 eride: 138 mg/dL)
 가
 (acetylcholinesterase: 46.5
 U/L, acetylcholine receptor antibody: 0.0010
 nmol/L, C-ANCA/P-ANCA/antinuclear antibody:
 / / , aldosterone: 3.40 ng/dL, CK: 626l
 U/L) 가
 B12
 B12
 (folate: 6.30 ng/mL, vitamin B12: 766.66
 pg/mL)

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 ,
 18.75 (m³)
 (Fig. 1, Fig. 2).
 가
 100%
 ,
 300 가 100%
 3
 100%
 3
 가 70 30
 ,
 1 1
 , 2002 6~7 (8 가
), 2003 5 (6~7 가
), 2004 2 4~5 (5~6 가
)
 1~2 (2~3 가)

80



Fig. 1. Ventilation system in the workplace and cleansing boxes filled with n-hexane



Fig. 2. N-hexane containing cleansing box and only one window in the workplace

Table 2. Concentration of n-hexane in the workplace air

	Sampler		Sampler	
Time (min)	15	28	16	62
n-Hexane concentration (ppm)	1443.87	1609.79	1033.17	(break through)

1411.24 ppm , 8 가
ppm

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882

가

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