

Some Psychological Effects of Thinner Sniffing.

Thyon Chentanez*

Thirayudh Glinsukon* Rungchai Chaunchaiyakul**

Chentanez T, Glinsukon T, Chaunchaiyakul R. Some psychological effects of thinner sniffing. Chula Med J 1988 Aug; 32(8): 739-752

Fifteen male lacquer thinner sniffers (14.5-20 year old) in Bangkok, Thailand, were interviewed for their subjective feelings during thinner intoxication. All had been sniffing "Fish Brand" lacquer thinner almost daily for over 3 (range 1-6) years and habitually sniffed thinner in groups of 5-6 persons during late evening because of the "good atmosphere" it produced. Most sensory perceptions decreased during thinner intoxication, and many visual and auditory illusions and hallucinations were reported. The visual illusions were particularly prominent, and consisted of alterations of colour, shape, depth, size, distance, speed of movement ("slow motion"-like visual perception) and the number of objects perceived (e.g. double or multiple vision). The main hallucinatory effect was difficulty in differentiating the imaginary from the real. Hunger and muscular strength were reported to be decreased. Talking became slower but more fun during thinner intoxication. Most sniffers felt that they slept better (deeper) during intoxication. The subjective feelings during thinner intoxication were reported to be much different from those resulting from ethanol intoxication.

Reprint requests: Chentanez T, Department of Physiology, Faculty of Science, Mahidol University, Rama VI Rd., Bangkok 10400, Thailand.

Received for publication. October 6, 1987

* Department of Physiology, Faculty of Science, Mahidol University, Rama VI Rd., Bangkok 10400, Thailand

** Department of Rehabilitation Medicine, Pramongkut Klao Medical College, Rajvithi Rd., Bangkok 10400, Thailand

ได้ออน จีนเรนค, ธีระบุทธ กลิ่นสุคนธ์, รุ่งชัย ชวนไชยะกุล. การเปลี่ยนแปลงทางจิตวิทยาขณะเมาทินเนอร์.
จุฬาลงกรณ์เวชสาร 2531 กรกฎาคม : 32(7) : 739-752

ได้ทำการสัมภาษณ์ผู้ติดทินเนอร์เด็กวัยรุ่นผู้ชายอายุเฉลี่ย 16.9 ปี (14.5 ถึง 20 ปี) ที่ติดทินเนอร์มาเป็นเวลา 1-6 ปี (เฉลี่ย 3 ปี) เป็นจำนวน 15 คน ถึงความรู้สึกนึกคิดและความสามารถในการเคลื่อนไหวขณะกำลังเมาทินเนอร์ ได้ข้อมูลดังต่อไปนี้คือ ผู้ติดทินเนอร์เหล่านี้ชอบสูดทินเนอร์ตราปาลานิล, ชอบสูดดมเป็นกลุ่ม ๆ ละ 5-6 คนในเวลาเย็นจนถึงดึก เพราะชอบบรรยากาศซึ่งทำให้เพลิดเพลิน การรับรู้ความรู้สึกทั่วไปเช่นการมองเห็น การได้ยิน การสัมผัส การรับรู้ความเจ็บปวดลดลงขณะเมาทินเนอร์ มีการเห็นภาพหลอน เช่นเห็นสี รูปทรง ขนาด ระยะห่าง ความเร็วการเคลื่อนไหวของวัตถุต่าง ๆ เปลี่ยนไปจากความเป็นจริง มักเห็นวัตถุเป็นภาพหลอนสองภาพหรือหลายภาพ เห็นวัตถุที่กำลังเคลื่อนไหวช้ากว่าความเป็นจริง ขณะเมาทินเนอร์มีอาการประสาทหลอนไม่สามารถแยกสิ่งที่ตนเองจินตนาการออกจากความเป็นจริงได้ ผู้เมาทินเนอร์รู้สึกว่าการหิวและแรงของกล้ามเนื้อลดลง เขารู้สึกว่านอนหลับสนิทมากขึ้นขณะเมาทินเนอร์ เมื่อให้เขาบอกความแตกต่างระหว่างการเมาทินเนอร์เทียบกับสูราคำตอบส่วนใหญ่บอกว่าอาการเมาสารทั้งสองแตกต่างกันมากในแง่ผลต่อความรู้สึกนึกคิด

There are a great number of reports on the neurotoxicity of lacquer thinners with various compositions.⁽¹⁻³⁾ There are also many reports on the neurotoxicity of their individual constituents such as toluene⁽⁴⁻⁷⁾ and methanol⁽⁸⁻¹⁰⁾. Glinsukon et al.⁽¹¹⁾ reported that 13 brands of lacquer thinners produced in Thailand contained 23.3-49.1% methanol, 20.2-49.4% toluene, 7.1-17.2% isobutanol and 3.4-18.1% of unidentified components. Among these lacquer thinners the "Fish Brand" or "Pla Nin" brand (with no label of the manufacturer's address) is the most popularly abused by thinner sniffers in Thailand. The neurotoxicity of this lacquer thinner was speculated based on reports on the toxicity of its major constituents, methanol and toluene, as mentioned above. Although there are numerous reports on neurological changes caused by components of lacquer thinners, reports on the psychological effects are relatively rare.⁽¹²⁻¹³⁾ Therefore, the present study on the subjective reports concerning psychological, motor and sensory changes during lacquer thinner intoxication was carried out to increase our understanding of the effects of this group of mixed solvents on nervous system functions. The data may be also useful for future quantitative measurements to prove or disprove the subjective reports, and it may also be useful for planning studies of comparable parameters in animal models intoxicated with lacquer thinner or individual solvents to understand in more detail the mechanisms of intoxication. In addition, several questions were asked in order to explore some differences in psychological effects of thinner and ethanol.

MATERIALS AND METHODS

Fifteen teenage male lacquer thinner sniffers recruited from several slum areas in Bangkok were interviewed concerning their subjective feeling during thinner intoxication. Approximately 30 questions were asked during the daytime when the effects of thinner intoxication had subsided. The following are examples of the questions asked:

1. Name, age, sex, address, profession, income and education.
2. How long had the subject been sniffing thinner?

3. What brand of the lacquer thinner did the subject sniff?
4. Why did the subject select this brand?
5. How did the subject get "hooked" by the thinner?
6. How often and how much did the subject sniff per day?
7. What time of the day did the subject like to sniff thinner the most, and why?
8. What is the procedure used in sniffing?
9. Does the subject like to sniff thinner in group or alone, and why?
10. What is his mood in general during thinner intoxication?
11. How does thinner intoxication differ from ethanol intoxication, subjectively?
12. Tell about subjective feelings of various sensory perceptions such as smell, vision, hearing, pain and touch. Are they increased, decreased or normal in magnitude during thinner intoxication, subjectively?
13. Are there hallucinations during thinner intoxication? Describe some of the hallucinations.
14. Are there illusions during thinner intoxication? Describe some of the illusions.
15. Tell about changes in appetite for food and in sleep during thinner intoxication.
16. What is the frequency of urination during thinner intoxication compared to normal conditions and ethanol intoxication.
17. What are the major subjects of talk during thinner intoxication?
18. Describe subjective feelings of muscular strength and tiredness after hard work during thinner intoxication.
19. How does the subject feel several days after stopping thinner sniffing?
20. Between thinner intoxication and ethanol intoxication; which does the subject prefer and why?

The thinner sniffers were subsequently subjected to extensive physical fitness testing and blood and urine chemistry analyses whose results will be reported separately in the near future.

RESULTS

The data obtained are summarized in Table I

Table I Summary of information and subjective feelings of lacquer thinner addicts in Bangkok, Thailand

Subjects of questions	Concepts of answers of most subject (about 60-100%)
– Number of thinner sniffers	15
– Age	16.9 ± 0.4 (range 14.5 to 20) year old
– Sex	Male
– Marriatal status	all single
– Maximum education	2 primary school 3 10 primary school 6 1 secondary school 1 2 secondary school 3
– Income	300-2000 baht/month
– Professions	1 noodle seller, 1 hired motor cycle driver, 2 gas-station service personel, 1 mini-bus ticket collector, 2 pig slaughterer, 1 pupil, 1 painter, 1 grocer and 6 unemployed
– Home area	mostly slum areas
– Length of thinner addiction	3.2 ± 0.4 (range 1 to 6) years
– Brand of thinner used	“Fish Brand” (Pla Nin Brand)
– Reasons for selecting the brand	good smell
– Amount of thinner used per day	130 ± 23 ml
– Procedure of sniffing	pour thinner on cloth and sniff
– Time of sniffing	mostly evening to late at night
– Reasons for choosing the time	“good atmosphere”, gives good visual illusions
– Number of peers during thinner sniffing	mostly 5-6 persons
– Reasons for sniffing in group	more fun from talking than sniffing alone
– Compare thinner and ethanol intoxication	very different
– Perceptions of smell, touch, pain, vision and hearing during thinner intoxication	all decreased
– Hallucinations during thinner intoxication	present
– Visual and auditory illusions during thinner intoxication	present
– Hungriness during thinner intoxication	decreased
– Sleep during thinner intoxication	better (deeper)
– Frequency of urination during thinner intoxication	normal (report subjectively)
– Subjective feeling of muscular strength during thinner intoxication	decreased
– Hard work tiredness during thinner intoxication	increased
– Talk during thinner intoxication	slower and less (judged by subjective feeling)
– Subjective feelings during thinner and ethanol intoxication	different

Table I (Cont.)

Subjects of questions	Concepts of answers of most subject (about 60-100%)
- Preference between thinner intoxication and ethanol intoxication	thinner, because it gives more satisfactory psychological effects
- Sensory functions and muscular strength during the period when not intoxicated by the thinner	decreased

All lacquer thinner sniffers interviewed were male, 16.9 ± 0.4 (range 14.5 to 20) years old. They sniffed thinner almost daily at an average amount of 130 ml/day poured on cloth (the exact amount getting into the body could not be estimated with certainty). The average period of sniffing was 3.2 ± 0.4 (range 1-6) years. All of the subjects sniffed "Fish Brand" or "Pla Nin Brand" lacquer thinner with no manufacturer's address on the label. They liked to sniff thinner during the evening and late in to the night because of the "good atmosphere" of darkness which gave them exciting visual illusions of light sources, and because most of them were free and relatively undisturbed at that time. They liked to sniff thinner in groups (of 5-6 persons) because it gave them more fun in talking, playing games and reading comic books. The general feeling after thinner intoxication was that they became inactive and lacking of attention. The perceptions of most sensory modalities such as smell, touch, pain, vision and audition were decreased.

Thinner and ethanol intoxications gave very different subjective feelings. The thinner gave brilliant illusions but the ethanol dulled feelings. During thinner intoxication most subjects lost their appetite for food. This may have contributed to their lower body weight compared to their socioeconomically matched control peers from the same slum areas (16-20 year old, 10 subjects, unpublished data). Most thinner sniffers reported that they could sleep better after sniffing thinner. The frequency of urination during thinner intoxication seemed to be normal (less than ethanol intoxication). There were many hallucinations and sensory illusions during thinner intoxication which will be described in detail below. They felt that their muscular strength became weaker and that they became tired more easily during thinner intoxication. During the day time when they did not sniff thinner their general sensory functions were poor and their muscular strength seemed to be weak.

Given a choice between thinner and ethanol intoxication, most of them chose thinner intoxication because it gave them "better feelings".

Many thinner addicts reported similar visual illusions during thinner intoxication, for example:

1) The colour and shape of objects became altered; for example the light from a bulb was perceived radiating with many colours.

2) The distance between objects was altered. Two objects could be perceived closer to each other or farther from each other at will.

3) Depth perception became altered such that far objects could be perceived nearer or farther away at will.

4) A still object could be perceived as moving in any direction at will.

5) A single object could be perceived as double or multiple.

6) The size of given object could be perceived as larger or smaller at will.

7) A moving object was perceived as moving slower than usual (e.g. a walking man, a moving car). This was described by some thinner sniffers as "slow motion"-like perception.

The common hallucination during thinner intoxication described by thinner sniffers was that when they imagined something they felt that it was real in their imagination, such as when they thought of something they felt that the thing appeared real (e.g. person, objects, ghost). This may be one of the reasons why they liked to sniff in group which make them less frightened if they imagined something fearful.

DISCUSSION

The variety of subjective sensory, motor and psychological changes during thinner intoxication mentioned above are similar in many aspects to those reviewed by Nylander⁽¹²⁾ and Press et al.⁽¹³⁾ There were some differences which could be due to

differences in the questions asked, differences in the composition of thinners used or differences in the cultural backgrounds of the addicts. The above changes indicate that the organic solvents in the lacquer thinner altered the functions of the nervous system. This speculation is supported by reports that the major constituents of lacquer thinners in Thailand are toluene and methanol.⁽¹¹⁾ The toxicities of toluene and methanol on the nervous system have been well documented.⁽⁴⁻¹⁰⁾ In addition, Yamawaki et al.⁽¹⁴⁾ showed that rats chronically exposed to toluene (0.7% in air) had lower (³H)-serotonin binding in several brain areas. This further indicates that there are interactions between toluene and several brain areas.

In conclusion, the above data on psychological effects of thinner sniffing were obtained by simple questioning the addicts. Subjective perception to sensory, motor and psychological changes during thinner intoxication were partly obtained. In general, sensory perceptions of all modalities were decreased,

motor and muscle power were subjectively reported to be decreased during thinner intoxication. Visual illusions during thinner intoxication were reported to be very prominent such as alterations of colour, shape, depth, size, distance, speed of movement ("slow motion"-like visual perception) and the number of objects perceived (e.g. double or multiple vision). The main hallucinatory effect of thinner was the difficulty in differentiating the imaginary from the real. Hunger was reported to be decreased. Talking was reported to be slow, subjectively. Sleeping was reported to be better during thinner intoxication. The psychological effects of thinner were reported to be different from that of ethanol.

ACKNOWLEDGEMENTS

The authors would like to thank Dr. Warren Y. Brockelman for his help on correcting the manuscript and Mrs. Kosoom Vongthai for her secretarial help.

References

1. Means ED, Prockop LD, Hooper GS. Pathology of lacquer thinner induced neuropathy. *Ann Clin Lab Sci* 1976 May-Jun; 6(3): 240-250
2. Prockop LD. Specific neurological evaluation of inhalant abusers: clinical and laboratory. In: Sharpe CWM, Brehm ML, eds. *Review of Inhalants: Euphoria to Dysfunction*. NIDA Research Monograph 15, Oct. 1977, US Gov. Printing Office, Washington, D.C. 1977. 81-97
3. Spencer PS, Bischoff MC, Schaumburg HH. On the specific molecular configuration of neurotoxic aliphatic hexacarbon compounds causing central-peripheral distal axonopathy. *Toxicol Appl Pharmacol* 1978 Apr; 44(1): 17-28
4. Fornazzari L, Wilkinson DA, Kupur BM, Carlen PL. Cerebellar, cortical and functional impairment in toluene abusers. *Acta Neurol Scand* 1983; 67: 319-329
5. Lazar RB, Ho SU, Melen O, Daghestani AN. Multifocal central nervous system damage caused by toluene abuse. *Neurology (Cleveland)* 1983 Oct; 33(10): 1337-1340
6. Grabski DA. Toluene sniffing producing cerebellar degeneration. *Am J Psychiatry* 1962 Nov; 118(5): 461-462
7. Knox JW, Nelson JR. Permanent encephalopathy from toluene inhalation. *N Engl J Med* 1966 Dec 29; 275(26): 1494-1496
8. Martin-Amat G, McMartin KE, Hayreh SS, Hayreh MS, Tephly TR. Methanol poisoning: ocular toxicity produced by formate. *Toxicol Appl Pharmacol* 1978 Jul; 45(1): 201-208
9. Sharpe JA, Hostovsky M, Bilbao JM, Rewcastle NB. Methanol optic neuropathy. A histopathological study. *Neurology (NY)* 1982 Oct; 32(10): 1093-1100
10. Benton CD, Calhoun FP. The ocular effects of methyl alcohol poisoning: report of a catastrophe involving 320 persons. *Am J Ophthalmol* 1953 Nov; 36(11): 1677-1685
11. Glinsukon T, Wangpanish W, Thebtaranonth Y, Piyachaturawat P. Chemical composition of thinner locally supplied in Bangkok. In: *Program and Abstracts of the 12th Annual Meeting of the Physiological Society (Thailand)*, Khoa Yai National Park, Nakornrajsima, 1983, 58
12. Nylander I. "Thinner" addiction in children and adolescents. *Acta Paedopsychiatrica* 1962; 29: 273-283
13. Press E, Done AK. Solvent sniffing, Physiologic

effects and community control measures for intoxication from the intentional inhalation of organic solvents. II. Pediatrics 1967 Apr; 39(4): 611-622

14. Yamawaki S, Segawa T, Sarai K. Effects of acute and chronic toluene inhalation on behaviour and (3H)-serotonin binding in rat. Life Sci 1982 Jan; 30(2): 1997-2002