

The Prevalence of Green Tobacco Sickness and Urinary Cotinine Concentrations among Korean Tobacco Harvesters

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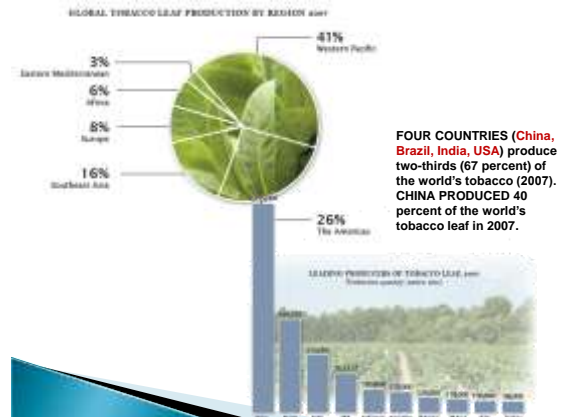


Introduction

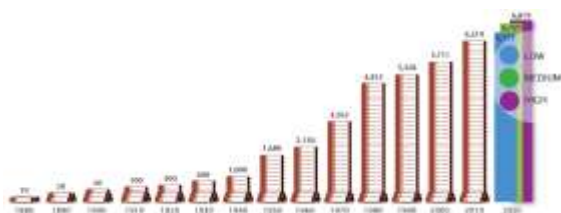
- Green tobacco sickness (GTS) is known as an occupational disease among tobacco harvesters, and a form of acute nicotine intoxication by the absorption of nicotine through the skin from the wet green tobacco plant.
- GTS was first reported among tobacco workers in Florida by Weizenecker and Deal (1970). Major symptoms are headache, dizziness, nausea and vomiting. In Korea, GTS was reported firstly in 2001.
- We carried out the questionnaire survey and the measurement of cotinine level to understand the prevalence, incidence density, and risk factors of GTS in Korean.

Prevalence and Incidence density Global and South Korea

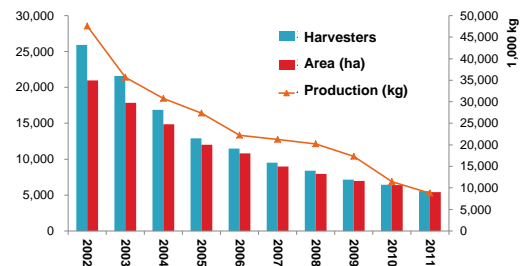
References	Time	Area	Sample (N)	Prevalence (%)	Incidence density (100 day-person)
Quandt et al. 2000	2000	USA (NC)	144	41.0	
Arcury et al. 2001a	2001	USA (NC)	182	8.2	1.9
Arcury et al. 2001b	2001	USA (NC)	182	24.2	
Arcury et al. 2003a	2003	USA (NC)	182		1.9
Gosh et al. 1979	1979	India	197	88.8	
Lim and Lee	2001	South Korea	First report		
Lim and Lee	2002	South Korea		67.0	16.4
Lim et al.	2004	South Korea		42.5	12.3
Lee and Lim	2005	South Korea		39.2	11.5
Lee et al.	2004	South Korea	Cotinine concentration in GTS patients		
Park et al.	2010	South Korea	Airborne concentration of nicotine		



GLOBAL CIGARETTE CONSUMPTION Billions of sticks, 1880-2020



The Production of Green Tobacco in South Korea



Materials and Methods

- The authors conducted a questionnaire survey cotinine measurement among the tobacco harvesters (40 cases, 20 couples in tobacco harvesting households) in Cheongsong-gun from 2008 to 2009.
- The applied case definition of GTS was vomiting or nausea and dizziness or headaches during or after tobacco harvesting.
- We measured cotinine concentration in urine before (morning, T1), during (a.m. T2 & p.m. T3), after (night, T4) tobacco harvesting. And we collected baseline urine (T5) in non-harvesting season.
- Urinary cotinine was analyzed with a reverse-phase high performance liquid chromatography (HPLC) system and expressed as geometric mean and standard deviation.



Definition of GTS

- Definition of GTS (By Dr. Arcury, 2001)
 - : ① + ② + ③
 - ① occurred relating to tobacco harvesting
 - ② headache or dizziness
 - ③ nausea or vomiting
- Generally GTS is defined by questionnaire

Results

Prevalence of green tobacco sickness according to age and gender

Age (years)	Male			Female			Total		
	Subjects	No. of cases	%	Subjects	No. of cases	%	Subjects	No. of cases	%
<50	1	0	0.0	3	2	66.7	4	2	50.0
50-59	11	2	18.2	12	6	50.0	23	8	34.8
≥60	8	2	25.0	5	3	60.0	13	5	38.5
total	20	4	20.0	20	11	55.0	40	15	37.5

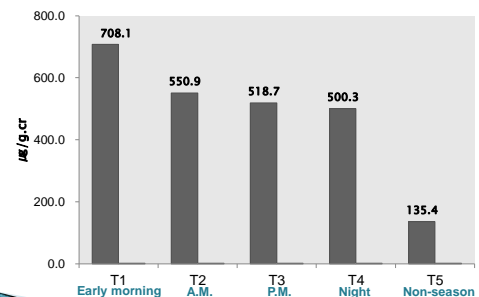
p<0.05 by Chi-square test

Non-smokers			Smokers			Total		
Subjects	No. of cases	%	Subjects	No. of cases	%	Subjects	No. of cases	%
26	15	57.7	14	0	0.0	40	15	37.5

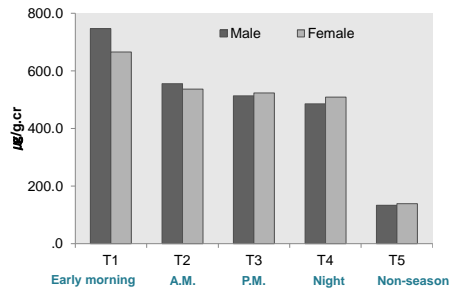
p<0.01 by Chi-square test

Incidence density 3.45 spells/100 person-days

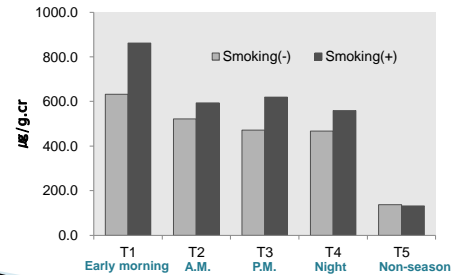
The cotinine level by time and period



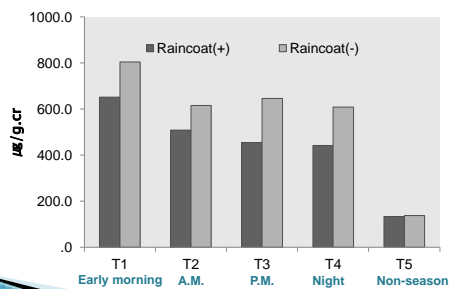
The cotinine level by gender



The cotinine level by smoking



The cotinine level by wearing raincoat



Conclusions

- In Korea, there were estimated 15,000 tobacco-harvesting workers in 2009, and most may be stricken with GTS. And these suffering may continue unless cigarette disappears on the planet. In the future it is expected that more extensive epidemiological studies including the incidence and associated risk factors will be conducted.

Global Network Green Tobacco Sickness

