

ERRATUM TO HASEGAWA ET AL. “THE RESPIRATORY EFFECTS OF TONER EXPOSURE ACCORDING TO LONG-TERM OCCUPATIONAL TONER HANDLING HISTORY: A LONGITUDINAL ANALYSIS, 2004–2013” (INT J OCCUP MED ENVIRON HEALTH 2018;31(6):809–22)

The original version of the article was published in “International Journal of Occupational Medicine and Environmental Health” 2018;31(6):809–22, <https://doi.org/10.13075/ijomeh.1896.01285>.

1. On page 814 and 816 the text should read as bolded:

Biomarker analyses

The Table 1 shows the effects of toner exposure on biomarker levels using panel data analysis according to annual toner exposure. Although significant differences were found in biomarker concentrations associated with toner exposure for some biomarkers, all biomarker concentrations were lower in the toner-handling group than in the reference group.

When analyzing the interaction between toner exposure and smoking, a significantly higher **8-OHdG/Cre concentration was found among past or never smokers in the toner-handling group when compared to the reference group (4.56 ng/mg Cre vs. 4.20 ng/mg Cre, respectively) in 2005. Among those who reported current**

smoking, a significantly lower IFN- γ concentration (reference, ≤ 0.1 IU/ml) was found in the toner-handling group when compared to the reference group in 2008 (0.050 IU/ml vs. 0.054 IU/ml, respectively), and higher IgE concentration (reference, ≤ 173 IU/ml) in the toner-handling group when compared to the reference group in 2013 (150.0 IU/ml vs. 78.5 IU/ml, respectively). On the other hand, no significant differences were found between the toner-handling group and the reference group in the IgE levels among past or never smokers in 2013 (79.8 IU/ml vs. 71.9 IU/ml, respectively).

DISCUSSION

Biomarker analyses

The significantly higher **8-OHdG/Cre** and IgE concentrations were found in the time-point exposure analysis in the toner-handling when compared to the reference group.

2. Below Table 1 and 2 with the corrected cells and explanations marked bold.

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Table 1. Effects of toner exposure on biomarker levels

	2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		
	GM	p	GM	p	GM	p	GM	p	GM	p	GM	p	GM	p	GM	p	GM	p	GM	p	
WBC [n/μl]																					
toner-handling	5996.5	0.15	5 991.9	0.10	5 895.9	0.06	6 069.6	0.30	5 908.1	0.47	6 189.7	0.07	5 994.3	0.10	6 113.4	0.46	6 003.8	0.20	5 884.6	0.07	
referent	6157.3		6 203.8		6 110.2		6 271.3		6 059.3		6 344.3		6 165.7		6 236.4		6 111.4		6 126.2		
CRP [mg/dl]																					
toner-handling	0.07	0.56	0.06	0.76	0.06	0.25	0.05	0.57	-	-	-	-	-	-	-	-	-	-	-	-	-
referent	0.06		0.06		0.06		0.05		-		-		-		-		-		-		-
h-CRP [ng/ml]																					
toner-handling	-	-	-	-	-	-	-	-	322.1	0.37	304.4	0.14	264.3	0.07	318.6	0.64	324.4	0.27	312.8	0.34	
referent	-		-		-		-	358.5		341.4		308.6		310.6		347.1		364.1			
8-OHdG/Cre [ng/mgCre]																					
toner-handling	4.03	0.80	4.56	0.69	4.25	0.42	3.77	0.54	3.43	0.44	3.95	0.27	3.63	0.54	4.19	0.14	4.61	0.23	3.73	0.56	
referent	4.03		4.45		4.36		3.84		3.37		3.79		3.56		4.01		4.72		3.78		
IL-6 [pg/ml]																					
toner-handling	0.61	0.11	-	-	0.79	0.09	-	-	0.89	0.15	-	-	-	-	1.08	0.85	-	-	1.24	0.65	
referent	0.67		-		0.86		-		0.97		-		-	1.14		-		-	1.17		
IFN-γ [IU/ml]																					
toner-handling	0.08	0.96	-	-	0.05	0.52	-	-	0.05	0.11	-	-	-	0.06	0.54	-	-	-	0.05	0.58	
referent	0.08		-		0.05		-		0.05		-		-	0.06		-		-	0.05		
KL-6 [U/ml]																					
toner-handling	-	-	-	-	-	-	-	-	192.08	0.22	-	-	-	-	220.57	<0.01**	-	-	214.29	<0.01**	
referent	-		-		-		-	199.20		-	-	-	-	235.75		-	-	230.30			
SP-D [ng/ml]																					
toner-handling	-	-	-	-	-	-	-	-	30.83	0.02*	-	-	-	-	36.24	0.98	-	-	35.38	0.48	
referent	-		-		-		-	36.21		-	-	-	-	35.55		-	-	36.10			

IgE [IU/ml]																
toner-handling	92.52	0.06	-	95.40	0.04*	-	94.89	0.10	-	-	-	88.75	0.11	-	96.25	<0.01**
referent	74.31	-	74.94	-	-	79.31	-	-	-	-	-	77.33	-	-	73.86	

GM – geometric mean.

WBC – white blood cell; CRP – C-reactive protein; h-CRP – high sensitivity C-reactive protein; 8-OHdG/Cr – 8-hydroxy-2'-deoxyguanosine; IL-6 – interleukin-6; IFN- γ – interferon gamma; KL-6 – sialylated carbohydrate antigen KL-6; SP-D – surfactant protein D; IgE – immunoglobulin E.

Toner-handling: panel data analysis methods according to annual toner exposure state (Figure 1).

Each biomarker was transformed logarithmically, considering the effects of distribution on statistical analysis.

Two-way analysis of variance (two-way ANOVA) was performed on each biomarker.

For independent variables, the time-point exposure category and smoking category were used.

Two-way ANOVA: * $p < 0.05$, ** $p < 0.01$.

Table 2. Comparison of the annual change of respiratory function indices

Variables in groups	Toner-exposed ^a (N = 518)		Never toner-handling (N = 150)		P
	Me	Me rank	Me	Me rank	
Current or former smokers					
FVC [l/year]	-0.008	212.15	-0.012	202.65	0.50
FEV ₁ [l/year]	-0.020	211.32	-0.023	203.31	0.57
FEV ₁ % [%/year]	-0.234	210.87	-0.240	207.03	0.79
Never smokers					
FVC [l/year]	-0.007	125.22	-0.011	126.49	0.91
FEV ₁ [l/year]	-0.019	125.62	-0.019	125.62	0.96
FEV ₁ % [%/year]	-0.260	125.70	-0.259	124.80	0.94
Total					
FVC [l/year]	-0.007	336.86	-0.011	328.56	0.64
FEV ₁ [l/year]	-0.020	336.87	-0.022	326.31	0.56
FEV ₁ % [%/year]	-0.245	336.13	-0.253	331.1	0.78

FVC – forced vital capacity; FEV₁ – forced expiratory volume in one second; FEV₁ % – forced expiratory volume percentile in 1 s.

Current or former smoker: toner-exposed N = **323**, never toner-handling N = **95**.

Never smoker: toner-exposed N = **195**, never toner-handling N = **55**.

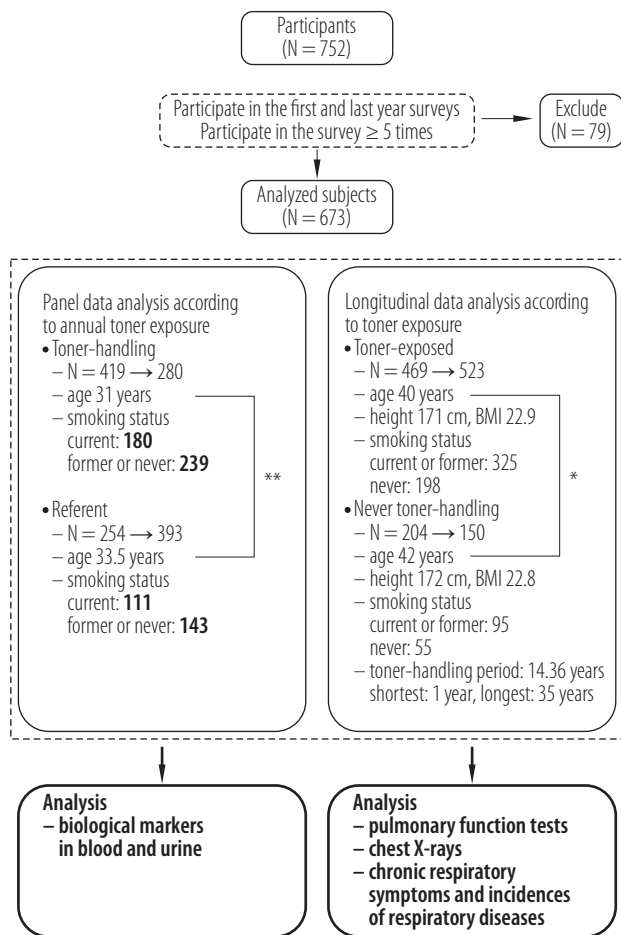
Toner-exposed: longitudinal data analysis according to toner exposure (Figure 1).

The annual change was calculated by determining the calibration curve from the measured values in each subject in 10 years, and its slope was considered the annual change (l/year or %/year).

Mann-Whitney U test was performed between toner-exposed group and never toner-handling group.

Analyzed by classifying into a group of current or former smoker and a group of never-smoker.

3. The correct data and missing text given in bold in Figure 1 are as follows:



BMI – body mass index.

Panel data analysis according to annual toner exposure;
n: 2004 → 2013, age: median in 2004, smoking status: number in 2004.

Longitudinal data analysis according to toner exposure;
n: 2004 → 2013, age: median in 2013, height; median in 2013, BMI; median in 2013, smoking status: number in 2013.

Toner-handling period: the mean occupational toner-handling period.

Analysis was performed between toner-handling and referent, toner-exposed and never toner-handling, age, height, BMI: Mann-Whitney U test, smoking status: Chi² test.

Mann-Whitney U test * p < 0.05; ** p < 0.01.

Fig. 1. Profile of selection of subjects and characteristics

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