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INTRODUCTION

Benzene is an aromatic, liquid, volatile and flammable hydrocarbon, present in gasoline, widely marketed at the reseller points of fuel (RPF) and classified as carcinogenic (group 1A) by IARC.

OBJECTIVE

The aim of this study is to evaluate hematological and immunological changes at gas station workers occupationally exposed to fuel in the city of Rio de Janeiro.

METHODS

This is a cross-sectional study with participation of workers at gas stations and office workers of both sexes and over 18 years old. Socioeconomic, clinical and exposure information to chemical agents during the working day were obtained by questionnaire. Hematological analysis was performed in an automated system with differential white and red cell counts, while the evaluation of the immunotoxic potential (cells of innate and acquired immunity) was performed by flow cytometry. PBMC was directly stained with fluorescently conjugated monoclonal antibodies (mAb) for 30 min at room temperature in the dark, after incubation with FcR blocking reagent. The blood was then lysed and read (104 events) on a FACScalibur cytometer using the Cell Quest Pro program.

RESULTS

324 workers at gas stations (South and Center area) and 219 office workers (INCA and UNIRIO) participated in this study during 2014-2016.

Table 1. Characteristics of study population (n= 543).

	Exposed (n=324)	Not exposed (n=219)	p-value*
Gender			
Male	224 (70.9)	92 (29.1)	0.00
Female	100 (44.1)	127 (55.9)	
Smoking			
No	228 (57.4)	169 (42.6)	0.09
Ex-smoker	52 (61.2)	33 (38.8)	
Yes	44 (72.1)	17 (27.9)	
Alcohol consumption			
No	118 (60.8)	76 (39.2)	0.68
Yes	206 (59.0)	143 (41.0)	
Industrialized food consumption			
No	30 (39.0)	47 (61.0)	0.00
1-2 times a week	164 (65.3)	87 (34.7)	
>2 times a week	123 (62.1)	75 (37.9)	
Working time			
≤ 9 years	259 (66.1)	133 (33.9)	0.10
10 to 20 years	37 (52.9)	33 (47.1)	
≥ 20 years	26 (61.9)	16 (38.1)	

Values expressed as absolute number and frequency. * Qui-square test.

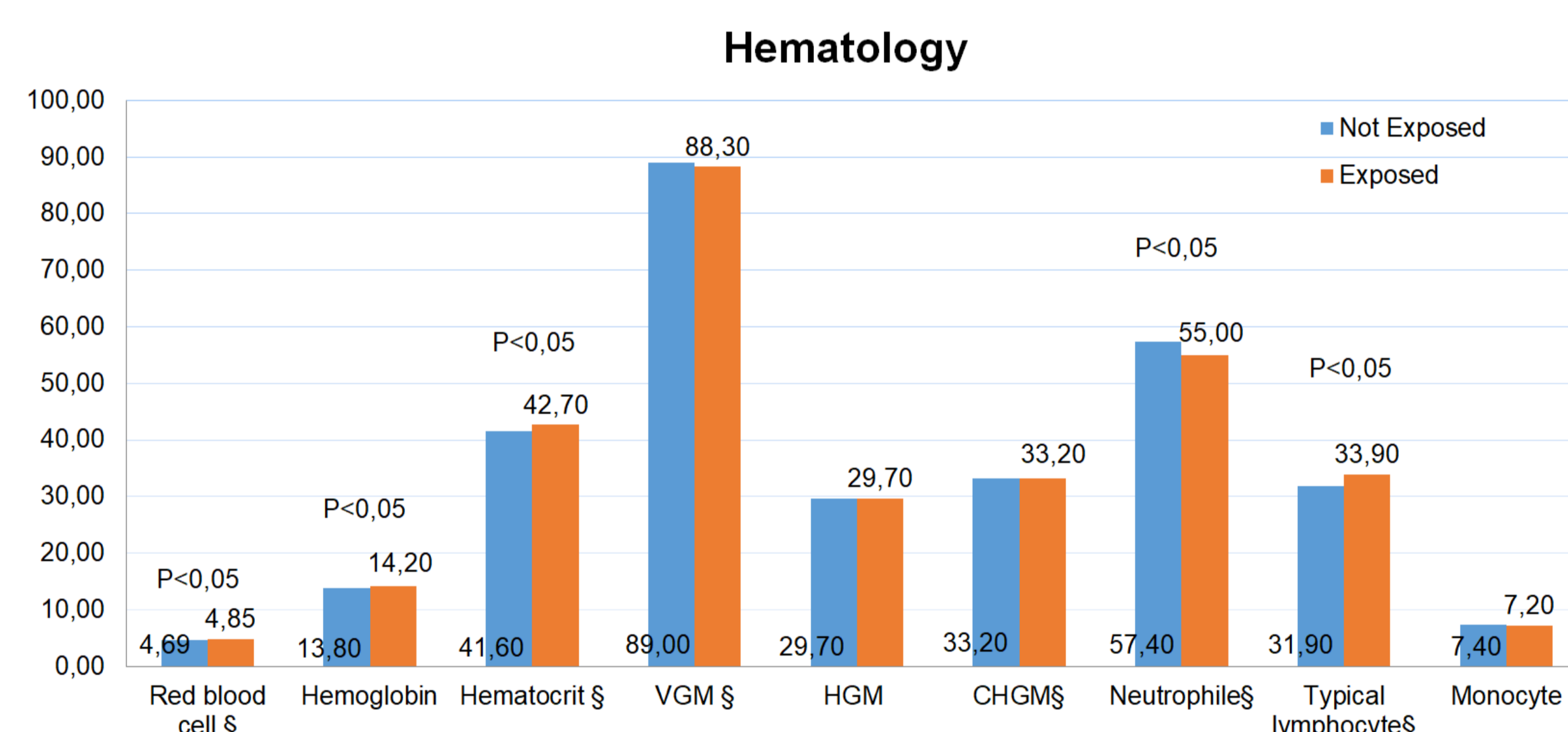


Figure 1. Hematological tests in the study population (N=543).

* # test Mann Whitney U; §: variable with normal distribution - ANOVA test.

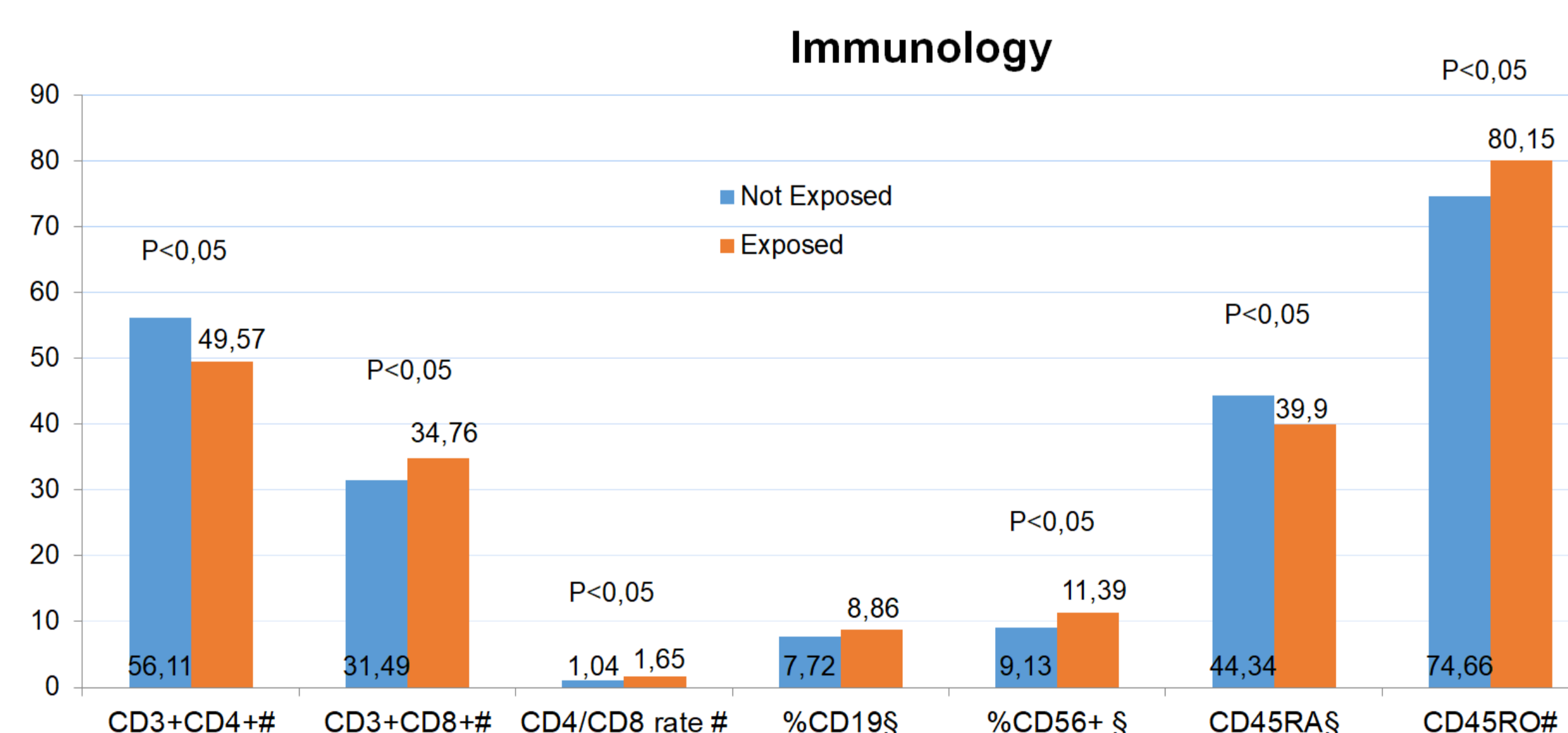


Figure 2. Immunological tests of the study population (N=543).

* # test Mann Whitney U; §: variable with normal distribution - ANOVA test.

CONCLUSION

Occupational exposure showed hematological and immunological changes, including neutropenia and immunostimulation (NK and B cells), corroborating with studies available in the literature and reinforcing the need for protective measures for workers at gas stations.

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