Evaluating the impact of the exposome on skin aging in 11 locations in Argentina by questionnaire and artificial intelligence diagnostic

Giselle Claros[1], Mariana Lequio[2], Santiago Cheli[3], Agustin Bollea Garlatti[4], Noelia Cecilia[5], Lucrecia Juarez[6], Mario Bittar[7], María José Leiva[8], Maria Laura Hernandez[9], Juan Manuel Marquez[10], Guillermo Badaracco[11]

[1]Centro de Dermatología Integral Dra Giselle Claros, Buenos Aires, Argentina; [2]Dermatología Patagonia, Río Negro, Argentina; [3]Instituto Dermatológico Belgrano, Jujuy, Argentina; [4]Bollea Garlatti Dermatologia y Estética, Tucumán, Argentina; [5]Nítida Centro Dermatólogico, Tucumán, Argentina; [6]Private Practice, Buenos Aires, Argentina; [7]Clincderm, Mendoza capital, Argentina; [8]Chajari Dermatological Institute, Entre Ríos, Argentina; [9]Consultorios Del Mar Salud, Tierra del Fuego, Argentina; [10]Clínica San Jorge Ushuaia, Tierra del Fuego, Argentina; [11]Consultorio Margulis Badaracco, Buenos Aires, Argentina

Disclosure of Conflicts of Interest

- This work was supported by Laboratoires Vichy (L'Oreal).
- All authors received support from Laboratoires Vichy for conducting the study.

Rationale and Objectives

- The exposome encompasses external and internal environmental exposures (including lifestyle factors) an individual is subjected to throughout their lifetime.[1]
- Exposome factors can accelerate skin aging.[2]

The objective of this cross-sectional study was to investigate associations between exposome factors and facial skin aging in participants from 11 locations in Argentina.

[1]*Wild, Complementing the genome with an "exposome": the outstanding challenge of environmental exposure measurement in molecular epidemiology, Cancer Epidemiol Biomarkers Prev 14(8) (2005) 1847-50.*
[2]*Krutmann J, et al. The skin aging exposome. J Dermatol Sci. 2017;85(3):152-61.*

Study Design

In this epidemiological, observational, cross-sectional study, participants from 11 Argentinian locations were recruited consecutively when attending a private dermatologist.

Analyses

- An exposome questionnaire.
- Photographs were clinically assessed by the Glogau classification.[3]
- Artificial Intelligence (AI)-based analysis of 7 skin aging signs.[4]

Participants

Characteristic	n (%)
Female gender, (N=1344)	1100 (82%)
Mean age [range], years, (N=1339)	42 [21-62] years
Fitzpatrick skin phototype III, (N=1333)	691 (52%)
Urban environment, (N=1326)	1247 (94%)
Lives at altitude of<1600 m, (N=1294)	1234 (95%)

[3]*Glogau RG. Aesthetic and anatomic analysis of the aging skin. Semin Cutan Med Surg. 1996 Sep;15(3):134-8.*
[4]*Jiang R, et al. A new procedure, free from human assessment that automatically grades some facial skin structural signs.*

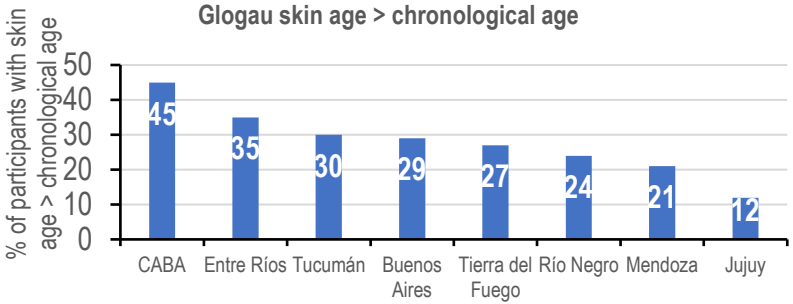
Results

8 provinces in Argentina

Premature skin aging was highest for participants from Ciudad de Buenos Aires (CABA; most polluted) and lowest for Jujuy (least polluted, highest UV index) at 45% vs 12 %, $p < 0.001$, respectively.

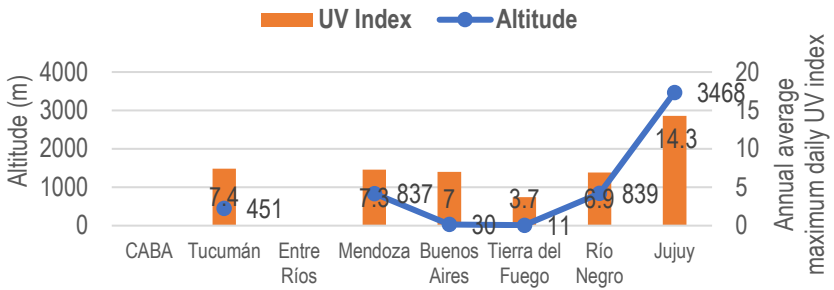
CABA had highest AI score for

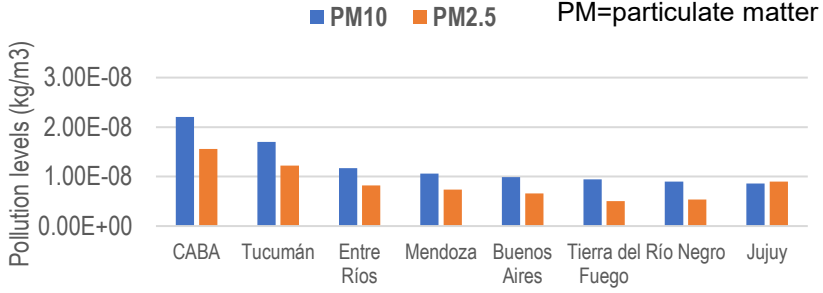
fine lines (1.18)
mean spot intensity (1.24)



Jujuy had lowest AI score for

fine lines (0.89)
and best skin firmness (0.95)





PM=particulate matter

Locations with higher pollution levels had more premature skin aging while locations at higher altitude and higher UV index did not have high premature aging.

Overall population

- The Glogau skin age was higher than the chronological age for 28% of overall participants and 36% of men.
- Physical outdoor activity and exposure to agrochemicals increased the risk for premature skin aging.
- Drinking > 1.5L water/day, anti-aging procedures and use of dermocosmetics decreased the risk.

Logistic regression analysis factors associated with skin aging (predictive model), N = 1246

Variable	Wald	p	Odds Ratio	95% CI
Age	24.571	<0.001	1.034	1.020 – 1.047
Physical activity	4.657	0.031	1.383	1.030 – 1.856
Exposure to agrochemicals	4.379	0.036	1.660	1.033 – 2.668
Use of daily cleansing product	12.439	<0.001	0.618	0.473 – 0.807
Anti-aging procedures	5.049	0.025	0.706	0.521 – 0.957

Conclusions

Several exposome factors increased the risk for premature skin aging (male gender, outdoor physical activity, exposure to agrochemicals, lower socioeconomic levels).
Other factors (high water intake, anti-aging procedures and dermocosmetics) decreased premature aging.
The locations with the highest pollution levels had more premature skin aging.