

Thyroid Cancer Multicenter Study in Adult Population of Cordoba, Argentina: a retrospective (1999-2019) 20-years study

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INTRODUCTION

Thyroid cancer represents the most common endocrine malignancy, accounting for 3.4% of all cancers diagnosed annually. **Differentiated thyroid cancers (DTC)** account for more than 90% of all thyroid malignancies and has increased exponentially in recent decades ¹.

There are positions that attribute this **increasing incidence to technological progress** in diagnostic methods like ultrasound and fine-needle aspiration biopsy ².

In turn, other authors think that the incidental detection would not fully explain the great growth of observed cases ³. They suggest that the explanation is probably **multifactorial with individual and environmental factors also contributing to the trends in thyroid cancer incidence** ⁴, such as autoimmunity and its probable facilitating effect of tumorigenesis ⁵, obesity which has had a presentation curve similar to thyroid cancer or insulin resistance because of the proliferative effect of hyperinsulinism ⁶. In addition, environmental factors, such as toxic or agrototoxic like glyphosate and atrazine and endocrine disruptors present in some work activities, have also been valued as etiological factors ⁷.

The aim of this study was to evaluate the prevalence and variables of differentiated thyroid cancer associated with response to treatment in the Province of Cordoba, Argentina

METHODS

Study design: Retrospective analysis. Patient's clinical charts from Public (27%) and Private (73%) Centers from 1999 to 2019 were reviewed (n=369), recording the origin urban or rural areas, clinical features, and pathological characteristics of the tumor.

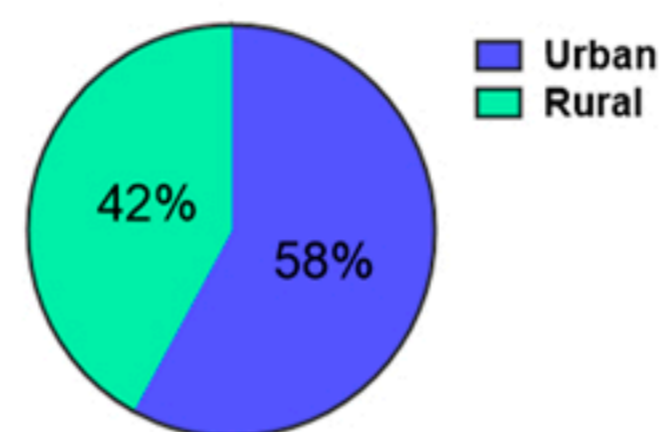
Statistics: Quantitative variables were described using mean and standard deviation (SD). For association between qualitative variables, Chi square test was used. Odds ratio (OR) and 95% confidence interval was calculated as well. A p<0.05 was considered statistically significant. Excel and Infostat software were used to collect and analyze data.

REFERENCES

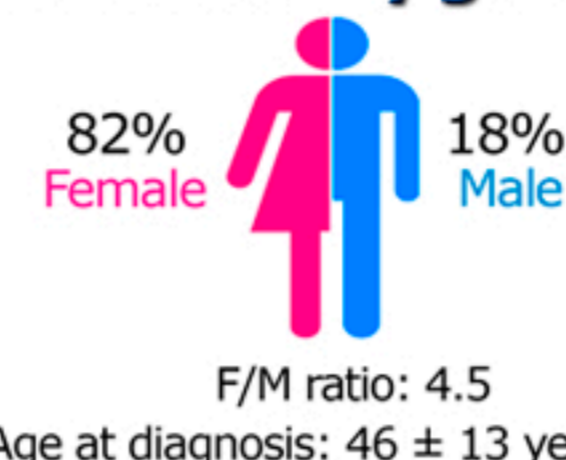
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Acknowledgments: We thank Paula Mereshian, Ma Eugenia Estario, Cynthia Cyperovich, Estela Delgado Martín, Natalia Monteserin, Laura Cecenarro, Cecilia Carrizo, Mauro Pautasso, Eduardo Cohen, Andrés De Benito, Claudia Sala, Lorena Bertolino, Paula Estario, Mónica Meritano for providing patient's clinical charts.

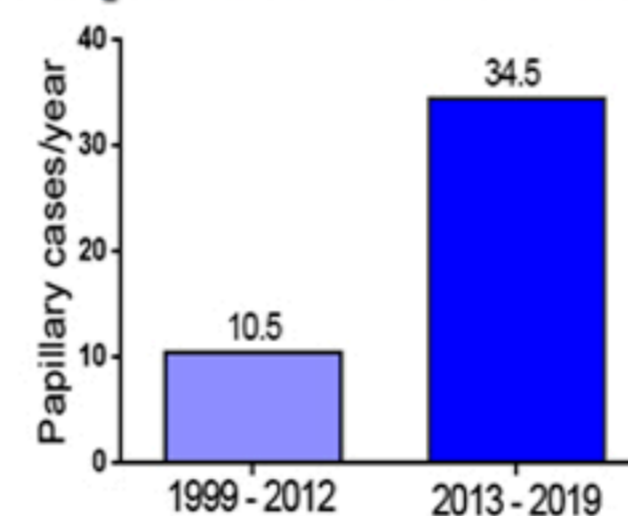
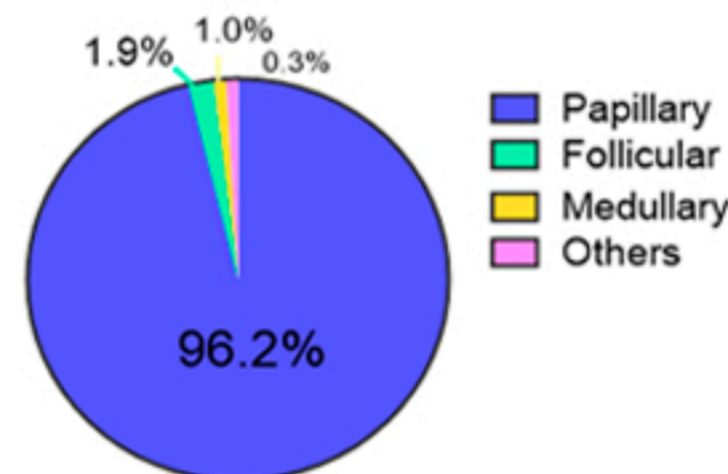
Urban - Rural residence



Prevalence by gender



The prevalence of papillary carcinoma increased in the last years, with a higher frequency of microcarcinomas.



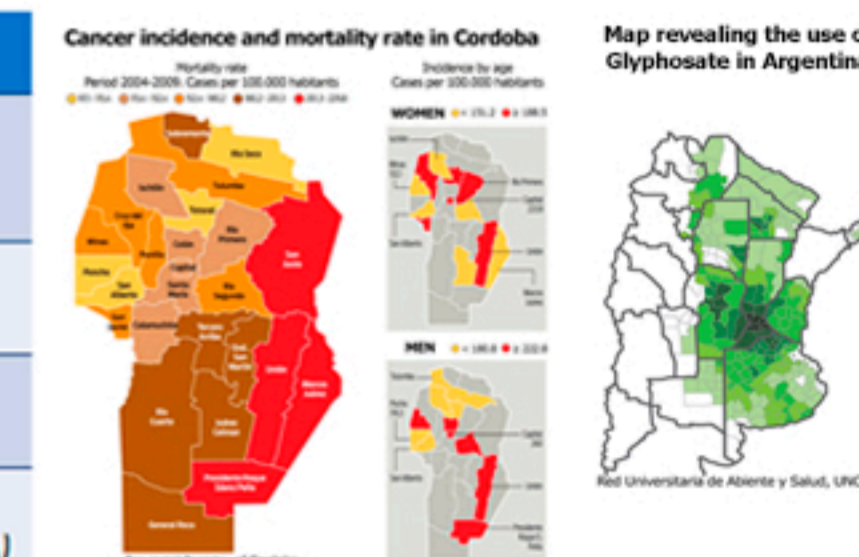
Diabetic patients showed a higher percentage of persistence after initial treatment compared to non-diabetic patients.

| | Diabetic patients | | Non-diabetic patients | | Odds ratio (OD) | IC 95 % | p-value |
|---------------------|-------------------|------|-----------------------|------|-----------------|-------------|---------|
| | N | % | N | % | | | |
| Treatment response | | | | | | | |
| Persistence disease | 84 | 29 % | 9 | 39 % | 3.89 | 1.65 - 9.15 | 0.0012 |
| Stable disease | 210 | 5 % | 14 | 3 % | | | |

RESULTS

A higher frequency of tumor size greater than 4 cm was observed in males, both in fumigated areas and non-fumigated areas.

| | Male (M) | | Female (F) | | p-value |
|-------------------------|---------------------|--------------------------|---------------------|--------------------------|--------------------|
| | Fumigated Area (FA) | Non-fumigated Area (NFA) | Fumigated Area (FA) | Non-fumigated Area (NFA) | |
| Tumor size > 4 cm | 8 % | 13 % | 6 % | 3 % | 0.0069 (M vs F) |
| Broad capsular invasion | 23 % | 5 % | 11 % | 3 % | 0.0097 (M vs F) |
| Recurrence risk | 23 % | 6 % | 11 % | 5 % | 0.0404 (FA vs NFA) |



Age at diagnosis was significantly different in fumigated areas vs. non-fumigated areas: 35-39 vs 50-54 years
Autoimmunity on tumor aggressiveness and response to treatment

| | TgAb - | | TgAb + | | Odds ratio (OD) | IC 95 % | p-value |
|-------------------------|--------|------|--------|------|-----------------|--------------|----------|
| | N | % | N | % | | | |
| Lymphovascular invasion | | | | | | | |
| > 4 vessels | 2 | 1 % | 5 | 10 % | 14.83 | 3.21 - 68.41 | < 0.0001 |
| < 4 vessels | 255 | 99 % | 43 | 90 % | | | |
| Recurrence risk | | | | | | | |
| High | 12 | 5 % | 6 | 13 % | 3.01 | 1.1 - 8.23 | 0.0295 |
| Low + Intermediate | 241 | 95 % | 40 | 87 % | | | |
| Treatment response | | | | | | | |
| Persistence disease | 66 | 27 % | 21 | 49 % | 2.62 | 1.36 - 5.04 | 0.0035 |
| Stable disease | 181 | 73 % | 22 | 51 % | | | |

Association between TSH levels at the time of diagnosis and DTC

We found no significant difference between patients with TSH at the lower end of the reference range (0.5-2.0 mU/L) and patients with TSH at the upper end (2.1- 4.0 mU/L) with respect to tumor aggressiveness, persistence or recurrence risk after initial treatment. However, an association between TSH levels and broad-extension capsular invasion in tumors larger than 4 cm was evidenced (TSH: 0.5-2.0: 1% vs TSH: 2.0 - 4.0 : 7%, p=0.05).

TPOAb

70% of patients with positive TPOAbs had an excellent response. In contrast, only 30% of patients with negative TPOAbs had an excellent response (p=0.0008)

CONCLUSIONS

- Our study contributes to evaluate the trend in the Province of Cordoba, Argentina where there may be a **real occurrence of DTC in areas with environmental toxics**.
- The **increased detection of papillary microcarcinomas with low risk of recurrence** after initial treatment over the two decades was consistent with literature ¹.
- We also found that in **fumigated areas with agrotoxics there was a significantly higher prevalence of recurrence**, both in men and women, with a difference in age at diagnosis between fumigated and non-fumigated areas.
- Our results suggest that **TgAb positivity** should be regarded as a sufficient **risk condition for an active search for recurrent or persistent disease**. Conversely, TgAb negative values can represent a good prognostic sign.