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Diagnostic delay of oral squamous cell carcinoma in two diagnosis centers in Córdoba Argentina

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ABSTRACT: The aim of the present study was to investigate diagnostic delay in oral cancer (OC) in two diagnosis centers in Córdoba, Argentina. Special attention was paid to the role of the patient and the professional in the diagnostic delay.

METHODS: Seventy clinical records of patients with newly diagnosed oral squamous cell carcinoma were included.

RESULTS: Both patients and professionals were responsible for the delay in diagnosis. This delay was longer for tumors in early stages. Multiple logistic regression analysis indicated that the professional delay was the most associated variable to the stage of tumor ($P = 0.03$).

CONCLUSIONS: Continuing education in OC and precancerous lesions is important to reduce the professional delay. The findings of the present study also indicate that 58% of the patients are partially responsible for delay in the diagnosis of OC. Intensive public promotion and educational campaigns against OC are also needed to increase patient awareness.

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Introduction

Stage at diagnosis is the most important prognostic indicator for oral and oropharyngeal squamous cell carcinoma. Unfortunately, approximately 50% of these cancers are identified late (stage III or IV) (1). If lesions are detected when they are small, localized, and treated expeditiously, survival rates of 70–90% can be achieved (2). Thus, the possibility of cure depends on the time elapsed between the first symptom and the beginning of the treatment (3).

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Delay in referral and diagnosis as well as the role of dental and medical professionals in the early detection of oral cancer (OC) have been studied in several populations (4–15).

The aim of the present study was to investigate the diagnostic delay in OC in two diagnosis centers in Córdoba Argentina.

Material and methods

This is a retrospective study of clinical records of OC patients, attended in a Stomatology B service (a referral clinic for oral soft-tissue lesions) and in the Oncohematology Unit of Hospital Nacional de Clínicas. Patients with oral squamous cell carcinoma (OSCC) diagnosed as the first cancer between 1992 and 2004 were included. Oral examinations and the diagnosis at both centers were made by the same trained professionals and supervised by the same head professor; a written consent was obtained from each patient.

Age, sex and location of the OC, first signs or symptoms, first consultation with a health professional (HP) were studied. Stage at the moment of diagnosis was classified according to the 1997 version of the Union Internationale Contre le Cancer (16). The symptoms were classified as pain, swelling, ulceration, white lesion, poor denture fit, and others. Stages III and IV were defined as advanced and stages I and II as early tumors (17).

Delay in the diagnosis of OC according to previous studies has been divided into:

(A) patient delay: the time elapsed between the first sign or symptom noticed by the patient and the first consultation with an HP (10);
(B) professional delay: the period of time between the first consultation with a HP and with the specialist who did the biopsy (10);
(C) hospital and patient delay: the period of time between the definitive diagnosis and the beginning of the treatment (15).

More than 30 days at any period (A, B or C) were considered as delay (17).

Table 1 Stage at diagnosis of oral cancer sites

Location	*n = 73*	*%*	*Early stage (%)*	*Late stage (%)*
Tongue	27	37	38	62
Gum	8	11	–	100
Toothless gum	8	11	28	72
Floor of mouth	10	14	–	100
Buccal mucosa	7	10	28	72
Trigone	3	4	–	100
Lip	4	5	100	–
Palate	6	8	–	100

Three patients had OSCC in more than one location.

Wilcoxon (Mann–Whitney *U*) and multiple logistic regression tests were applied using InfoStat/Professional version 1.1 (Faculty of Agronomic Sciences National University of Córdoba) statistical software package.

Results

Seventy patients diagnosed as OSCC were included, 46 (66%) were male and the M:F ratio was 1.9:1. The age ranged from 25 to 93 years and the average was 59.9 years. The most frequent location of the tumors was tongue $n = 27$ (37%). All the tumors located in gum, hard palate, floor of the mouth and retromolar trigone were diagnosed in advanced stage. One hundred percent of lip tumors were diagnosed in the early stage (Table 1). Pain was the most common first symptom and sign ($n = 27$) (38.5%) as shown in Table 2. The first HP consulted was the dentist in 30 (43%) patients followed by the physician in 21 patients (30%). Eighty percent of the patients received some prescription of treatment, being 30% of them poly-medicated; mouthwashes were indicated in 26%, and antibiotics and anti-inflammatory in 20% of the patients. Only four patients (6%) received biopsy indication at the first consultation (Table 3).

Tables 4 and 5 show the data corresponding to delays A and B, respectively, classified by stage. Forty patients (58%) had delay A, and forty-four (64%) delay B. In both cases, the delay was more important in early stages especially for professionals; this result is also shown in Fig. 1. On the other hand, the average in days for delay

Table 2 Most common first symptoms in oral cancer

Symptoms	*n (%)*
Pain	27 (38.5)
Tumor	8 (11.4)
Ulcer	8 (11.4)
Bleeding	5 (7.1)
Ardor	5 (7.1)
White or red patch	3 (4.3)
Poor denture fit	4 (5.7)
Hardness	2 (2.8)
Tooth mobility	2 (2.8)
Difficulty in speaking	1 (1.4)
No symptoms	5 (7.1)

Table 3 Most common prescriptions and treatment indicated

Treatment	*n (%)*
Poly-medicated	21 (30)
Mouthwashes	18 (26)
Antibiotics and others	14 (20)
Antibiotic only	4 (6)
Analgesic – anti-inflammatory	14 (20)
Local treatment	10 (14)
Antifungal	6 (8.5)
Self-medicated	5 (7)
Exodontias	7 (10)
Tooth or denture adjustment	8 (11)
Biopsy	4 (6)
No treatment	14 (20)
Without data	6 (8.5)

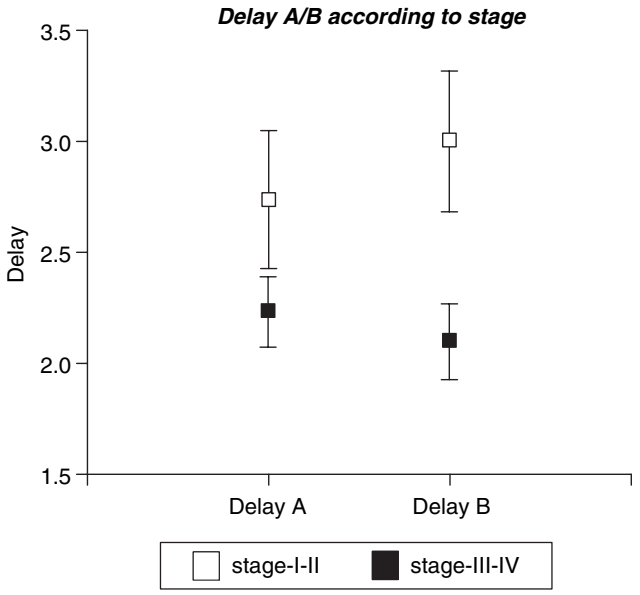

Figure 1 Patient and professional delay according to stage

Table 4 Patient delay (A) related to stage of tumor

	< 30 days, n (%)	*30–60 days, n (%)*	*60–120 days, n (%)*	*> 120 days, n (%)*	*Total delay, n (%)*
S I and II	6 (32)	2 (10)	3 (16)	8 (42)	13 (68)
S III and IV	23 (46)	12 (24)	8 (16)	7 (14)	27 (54)[a]
Total	29 (42)	14 (20)	11 (16)	15 (21)	40 (58)

[a]In one patient, delay A was unknown.

Table 5 Professional delay (B) related to stage of tumor

	< 30 days, n (%)	*30–60 days, n (%)*	*60–120 days, n (%)*	*> 120 days, n (%)*	*Total delay, n (%)*
S I and II	5 (28)	4 (22)	–	9 (50)	13 (72)[a]
S III and IV	20 (39)	6 (12)	18 (35)	7 (14)	31 (61)
Total	25 (36)	10 (14)	18 (26)	16 (23)	44 (64)

[a]In one patient, delay B was unknown.

Table 6 Hospital and patient delay (C) related to stage of tumor

	< 30 days, n (%)	*30–60 days, n (%)*	*60–120 days, n (%)*	*> 120 days, n (%)*	*Total delay, n (%)*
S I and II	12 (64)	2 (13)	1 (7)	–	3 (20)[a]
S III and IV	37 (77)	6 (13)	2 (4)	3 (6)	11 (23)[b]
Total	49 (78)	8 (12)	3 (5)	3 (5)	14 (22)

[a]In four patients, delay C was unknown.
[b]In three patients, delay C was unknown.

Table 7 Relationship between age, sex, location of oral cancer and delay A and B. Logistic Regression Analysis

Predictor	*Coefficient*	*EE*	*Odd*	*LI*	*LS*	*P*
Age	−0.01	0.02	0.99	0.95	1.03	0.58
Sex	−0.17	0.64	0.84	0.24	2.96	0.79
Localization	−0.17	0.12	0.84	0.66	1.08	0.14
Delay A	0.27	0.24	1.31	0.81	2.11	0.27
Delay B	0.48	0.22	1.62	1.04	2.51	0.03
Treatment	0.21	0.22	1.23	0.80	1.88	0.35

A was 77.5 days in females and 67.8 in males. Delay B was 70.4 days in females and 62.6 in males.

Only 22% of the patients had delay C, which was slightly greater in advanced stages (23%, see Table 6).

When the logistic regression analysis was applied, professional delay was the most related variable to the stage at the time of diagnosis ($P = 0.03$, see Table 7). Gender, sex, and tumor site were not related to the stage of OSCC.

Discussion

Mortality rate by malignant neoplasm in all sites increased by 6.6% in both sexes between 1975 and 2000 in Córdoba, Argentine. There was an increase of 59% by OC in men until 1995, and decreased in the last period down to the value of the first period studied (1975–1980); in women the increment was gradual, reaching 77% (18). In the Department of Oncohematology Hospital Nacional de Clínicas in Córdoba city the 5-year survival rate for persons with OC ranked between 22% when they were diagnosed in advanced stages (III and IV) and 78% in early stages (I and II) (19), indicating the importance of early detection and treatment of OC to improve the prognosis. Unfortunately, the delay from the onset of symptoms to the diagnosis is common and most of the cases are identified late. This consideration led us to investigate the diagnosis delay in OC in Córdoba. Different authors have studied this problem trying to determine who can be considered responsible for the delay, as shown in Table 8.

In our study 61% of the population analyzed had a delay in diagnosis (delay A and B) of more than 30 days. A study in Greece reported a similar finding with 52% of patients with more than 3 weeks of delay (20). Jovanovic *et al.* in the Netherlands reported a median time of 46 days (4). A median time until diagnosis of 3 months was observed in Canada (21) and Italy (22), while it was 4 months in Finland (23), Denmark (7) and Israel (6). Although our results are more favorable than those of other populations, the proportion of patients with delay was still considerably high.

Table 8 Responsibility of the diagnostic delay in OC according to different authors

Year	*Country*	*Author*	*n*	*Delay*
1992	The Netherlands	Jovanovic et al.	50	Patient
1992	Australia	Dimitroulis et al.	51	Patient
1994	Brazil	Kowalski et al.	336	Professional
1995	Israel	Gorsky et al.	543	Professional
1995	Denmark	Wildt et al.	167	Patient
1998	Malaysia	Khoo et al.	65	Patient and professional
1998	Canada	Allison et al.	188	Professional
2001	Thailand	Kerdpon et al.	161	Patient and professional
2003	Japan	Onizawa et al.	152	Professional
2005	The Netherlands	Tromp et al.	306	Patient
2005	Ireland	O'Sullivan et al.	370	Patient

In our study, the time elapsed between the first symptom and the consulting with HP (delay A) was 2.5 months in females and 2.3 in males while Onizawa *et al.* in Japan reported 1.6 months (11). The percentage of delay A in Córdoba of more than 1 month (58%), is similar to the value found by Jovanovic *et al.* (53.7%) (4) and lower than Pinholt *et al.* results (92%) (24).

It should be considered that there are some limitations to the current research, as the possibility that patients do not correctly recall the onset of symptoms. Wildt *et al.* argued that the information about the time at which symptoms were first noticed is imprecise (7). Pain was the most common first symptom and sign, but more than half of the patients did not visit a medical facility to receive treatment within 1 month following the occurrence. Onizawa *et al.* consider that the symptom may not be bothersome or serious enough to seek professional treatment (11).

The time elapsed between the first symptom and the diagnosis was longer for women than for men in our population (77.5 and 67.8 days respectively); Wildt *et al.* reported similar results (7). In the present work we observed that 100% of lip cancers and 38% of tongue lesions were staged as early cancers at the time of diagnosis (Table 1), while Gorsky and Dayan in Israel found 82% in lip and 58% of tongue tumors in the same stage (6). However, when logistic regression analysis was applied, we found that there was no significant association between the patient's delay (delay A) and age, sex and primary site and tumor stage, which is in agreement with other reports (4, 5, 7, 10, 26).

Professional delay (B), in our study was the most related variable to the stage at the time of diagnosis. As shown in Fig. 1 delay B was more important in early stages; this observation is relevant at the beginning of the treatment and also means worse prognosis. Similar results were reported by Onizawa *et al.* indicating that dentists were one of the significant variables related to the second step delay (11).

Although the first professional consulted was the dentist (43%), only 6% of the patients received biopsy indication and instead 80% was medicated. In Thailand, 32.3% were biopsed and 28.6% were medicated (10). Medical practitioners mainly prescribed various medications, whereas it is common that dentists adopted a more mechanical approach, extracting teeth and adjusting dentures (10) and tend to be slow to suspect malignancy.

Considering that the stage at diagnosis has an important prognostic value and that our study reveals that delay B was more important in early stages (Fig. 1) is a challenge to train professionals in oral examination to detect pre-cancerous lesions and first clinical manifestations of OC. Professional instruction should include a clarification about the direct channel in the referral system that could also reduce the professional delay.

Regarding the last step, we did not find association between stage and the beginning of the treatment (delay C) in agreement with Kowalski and Carvalho who observed that 94.3% of delays in beginning the treatment were due either to the patients refusal or to problems related to the healthcare system (15).

Although OC occurs in a part of the body that is readily accessible for early detection, most lesions are not diagnosed until advanced stages (25).

The findings of the present study also indicate that patients are partially responsible for delay in OC diagnosis. Intensive public promotion and educational campaigns are needed to increase patient awareness. Educational campaigns should also have primary focus on the habits such as tobacco and alcohol consumption, which increase the risk of oral cancer to prevent the development of the disease.

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