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## INTRODUCTION

In developing countries, tumors of the head and neck are diagnosed in advanced stages, compromising survival and therapeutic response.

## METHODS AND RESULTS

To evaluate the factors related to the therapeutic response in head and neck cancer we carried out a prospective cohort study, with 488 cases diagnosed with head and neck cancer at the National Cancer Institute (INCA) between March 2012 and July 2014, who accepted to participate in the multicenter project, called interCHANGE, coordinated by the International Agency for Research on Cancer (IARC). Sociodemographic, clinical, pathological and lifestyle related variables were collected. The therapeutic response (the presence or absence of disease at the first consultation after the first line treatment) was considered as a dependent variable. A descriptive analysis of the data was performed. Univariate logistic regression analysis was performed in order to obtain the predictive factors of the therapeutic response. The variables with  $p < 0.20$  were selected for the multiple model and  $p < 0.05$  was considered for the final model. Statistical package SPSS 20.0 was used for the analyzes. The project was approved by INCA's research ethics committee under registration 065/2012. The majority of the individuals were 60 years or older (52.7%), male (80.1%), white (62.7%), low educational status (63.4%) and body mass index (BMI)  $< 25 \text{ kg/m}^2$  (65.2%). About 87% of the cases reported being smokers or former and almost 79% were consumers or former users of alcohol. Almost all cases presented squamous cell carcinoma (SCC) and for all topographies the advanced staging was predominant (69.5%). For initial stages, the exclusive surgery was more often employed. The other therapeutic modalities were indicated for advanced stages. Oropharynx and hypopharynx cancers presented about 40% evidence of disease after the end of the first line treatment. After adjustment for age and staging, BMI and alcohol consumption were predictive factors of therapeutic response for all topographies. Cases with a BMI  $< 25 \text{ kg/m}^2$  had a 2.10 fold (1,289 - 3,428) higher probability of a worse therapeutic response and alcohol users presented a 1.91 fold (1.030 - 3.536) higher risk for this outcome.

Table 1. Absolute and relative frequencies of demographic and clinical variables.

Variáveis	Topographies (CID-10)					Total n (%)*
	Lip (C00) n (%)*	Oral Cavity (C01 – C06) n (%)*	Oropharynx (C09 – C10) n (%)*	Hypopharynx (C12 – C13) n (%)*	Larynx (C32) n (%)*	
<b>Age</b>						
<60	2 (28.6)	109 (46.8)	39 (60.0)	11 (55.0)	70 (42.9)	231 (47.3)
>ou= 60	5 (71.4)	124 (53.2)	26 (40.0)	9 (45.0)	93 (57.1)	257 (52.7)
<b>Sex</b>						
male	6 (85.7)	170 (73.0)	59 (90.8)	17 (85.0)	139 (85.3)	391 (80.1)
female	1 (14.3)	63 (27.0)	6 (9.2)	3 (15.0)	24 (14.7)	97 (19.9)
<b>Race</b>						
white	6 (85.7)	147 (63.1)	44 (67.7)	11 (55.0)	98 (60.1)	306 (62.7)
Others	1 (14.3)	86 (36.9)	21 (32.3)	9 (45.0)	65 (39.9)	182 (37.3)
<b>School</b>						
< 8 yrs	4 (57.1)	139 (59.7)	42 (64.6)	12 (60.0)	112 (69.1)	309 (63.4)
> ou = 8 yrs	3 (42.9)	94 (40.3)	23 (35.4)	8 (40.0)	50 (30.9)	178 (36.6)
<b>BMI</b>						
low weight, eutrophic	4 (57.1)	148 (63.5)	44 (69.8)	13 (65.0)	107 (66.0)	316 (65.2)
overweight, obese	3 (42.9)	85 (36.5)	19 (30.2)	7 (35.0)	55 (34.0)	169 (34.8)
<b>Smoke</b>						
smoker, former	6 (85.7)	194 (83.3)	57 (87.7)	17 (85.0)	152 (93.3)	426 (87.3)
never	1 (14.3)	39 (16.7)	8 (12.3)	3 (15.0)	11 (6.7)	62 (12.7)
<b>Alcohol</b>						
consumer, former	6 (85.7)	176 (75.5)	57 (87.7)	19 (95.0)	127 (77.9)	385 (78.9)
never	1 (14.3)	57 (24.5)	8 (12.3)	1 (5.0)	36 (22.1)	103 (21.1)
<b>Morphology</b>						
SCC	6 (85.7)	226 (97.0)	65 (100.0)	20 (100.0)	162 (99.4)	479 (98.2)
others	1 (14.3)	7 (3.0)	–	–	1 (0.6)	9 (1.8)
<b>Stage</b>						
I	2 (28.6)	36 (16.2)	3 (4.7)	2 (10.5)	28 (17.3)	71 (14.9)
II	5 (71.4)	41 (18.5)	4 (6.2)	2 (10.0)	22 (13.6)	74 (15.6)
III	–	37 (16.7)	11 (17.2)	4 (20.0)	33 (20.4)	85 (17.9)
IV	–	108 (48.6)	46 (71.9)	12 (60.0)	79 (48.8)	245 (51.6)

\*The differences means missing values.

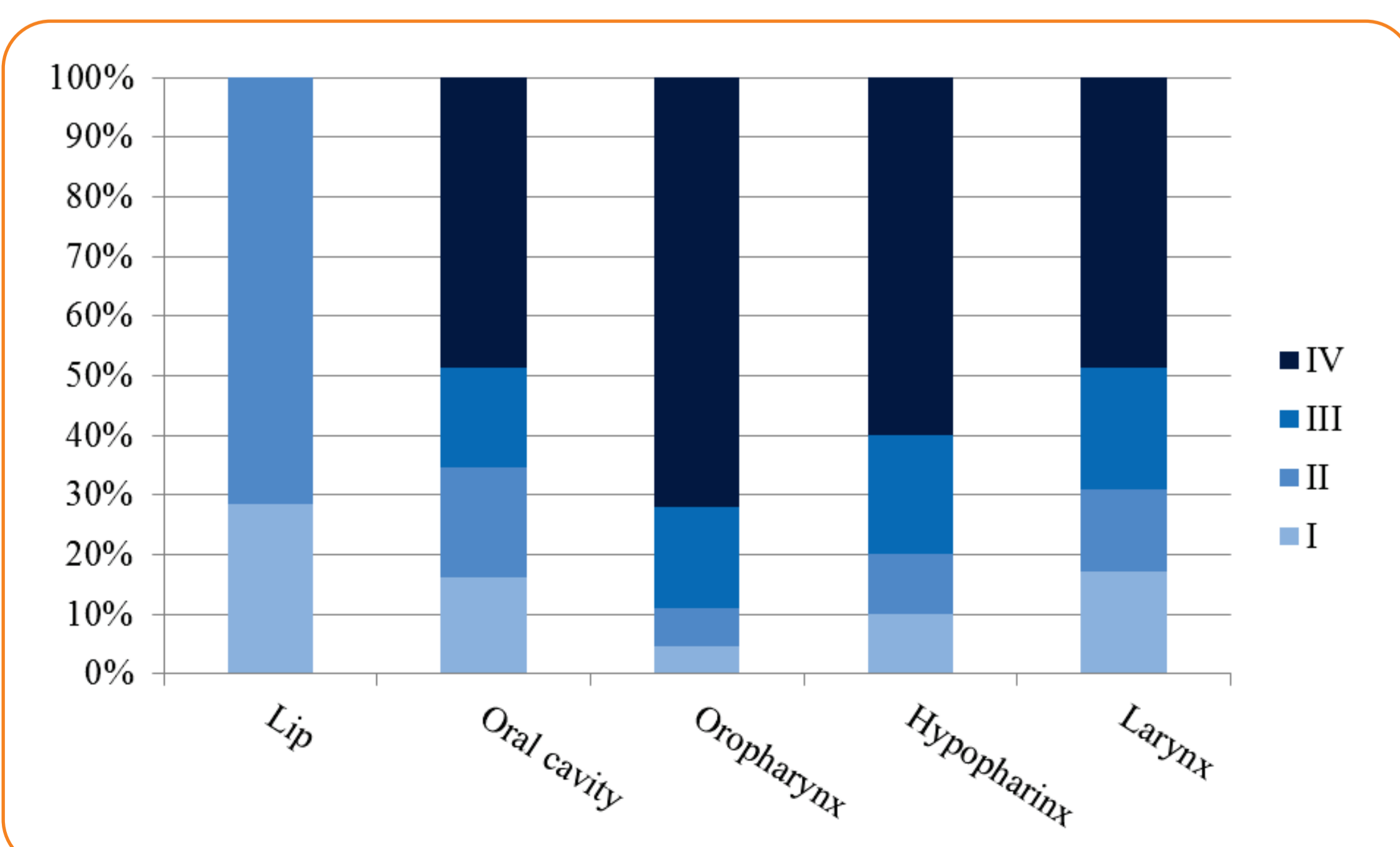


Figure 1. Distribution of staging by topographies

Table 2. Treatment modalities by stages.

Treatment Modalities	Stage				Total*
	I	II	III	IV	
surgery	46 (64.8)	32 (43.2)	11 (12.9)	27 (11.0)	116 (24.4)
surgery + RT	8 (11.3)	24 (32.4)	30 (35.3)	85 (34.7)	147 (30.9)
surgery + RT+ QT	2 (2.8)	6 (8.1)	2 (2.4)	11 (4.5)	21 (4.4)
RT	8 (11.3)	5 (6.8)	11 (12.9)	41 (16.7)	65 (13.7)
RT + QT	3 (4.2)	1 (1.4)	19 (22.4)	44 (18.0)	67 (14.1)
QT	–	1 (1.4)	1 (1.2)	2 (0.8)	4 (0.8)
surgery + QT	1 (1.4)	–	–	1 (0.4)	2 (0.4)
out of INCA	3 (4.2)	1 (1.4)	3 (3.5)	11 (4.5)	18 (3.8)
without treatment	–	4 (5.4)	8 (9.4)	23 (9.4)	35 (7.4)

\*The differences means missing values.

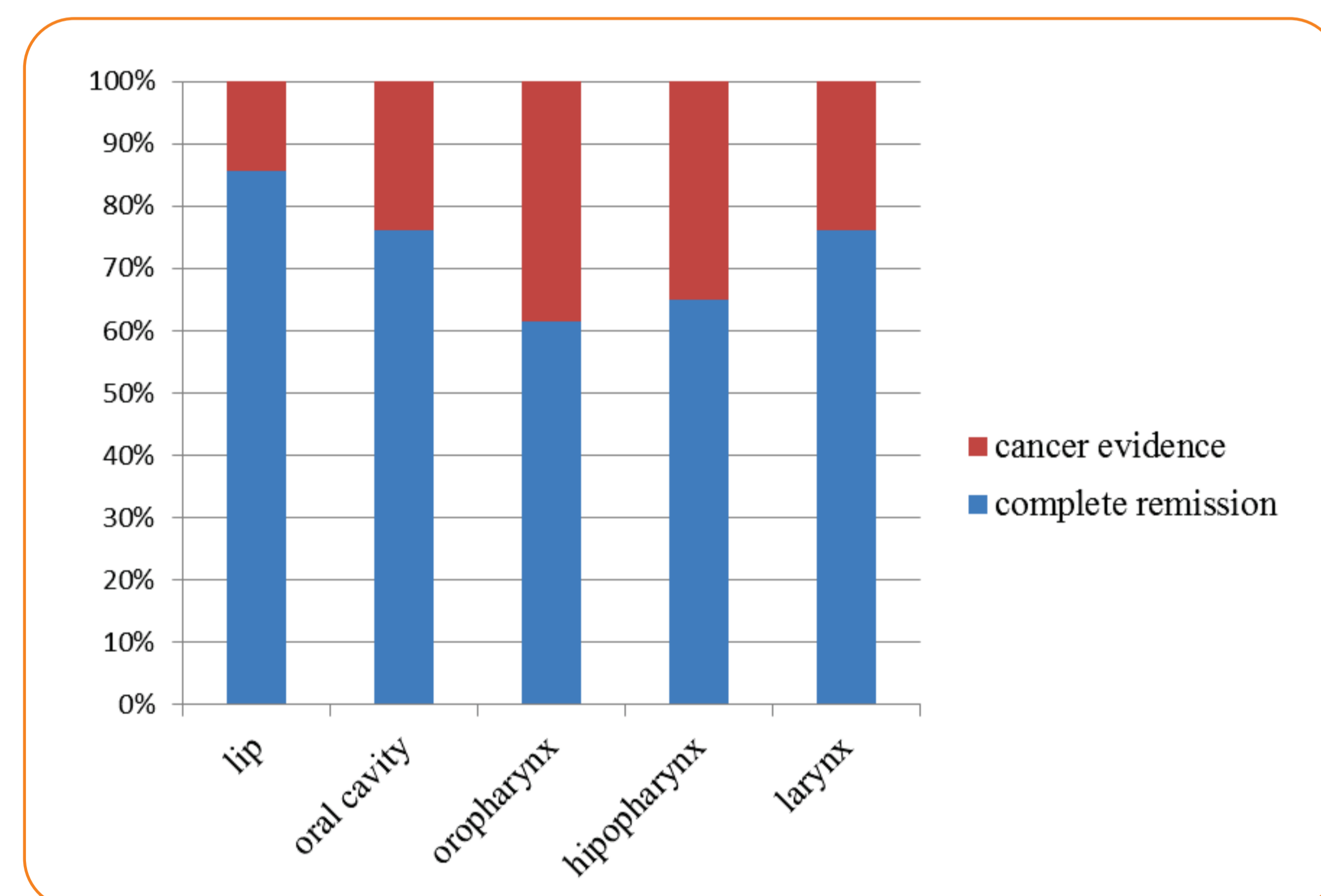


Figure 2. Cancer evidence and remission by topographies.

Table 3. Risk factors for inadequate treatment response.

Variáveis	OR*	IC 95%	p valor	
<b>BMI (&lt;25kg/m<sup>2</sup> x ≥25kg/m<sup>2</sup>)</b>	2,10	1,289	3,428	0,003
<b>Alcohol consumption (active+former x never)</b>	1,91	1,030	3,536	0,040

\* adjustment for age and staging

## CONCLUSION

Low BMI than  $25 \text{ kg/m}^2$  and alcohol consumption predicted a worse therapeutic response.

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