

Research Article

Laryngeal cancer, risk factors, symptoms and treatment

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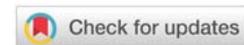
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The objective of this study is to identify trends in demographics, symptoms and treatment of laryngeal cancer and to analyze risk factors contributing to the emergence of this cancer. Review of 679 cases with laryngeal cancer diagnosed between the years 2002 and 2011 in ENT SERVICE in University Hospital Center "Mother Teresa". Analysis of these case records addressed demographics, risk factors and treatment for cases according to stage, site and TNM classifications. In all cases, their diagnosis has been confirmed by histopathological studies.

Results

Epidemiological features

Prevalence: in 10 years, 679 individuals with laryngeal cancer have been reported.

Incidence: in this study incidence is 2.27 per 100.000 inhabitants, meanwhile in the world the incidence is 3.6 per 100,000 inhabitants [1-4].

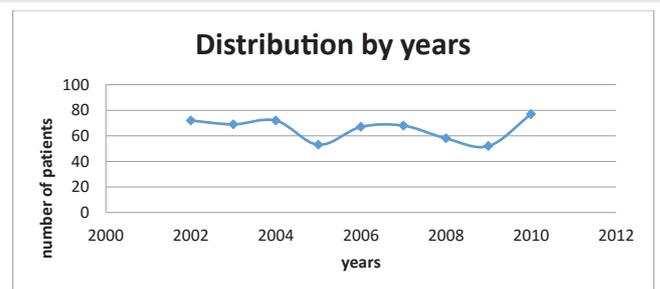
Distribution by years: From the distribution by years we see it is a 10 year period are diagnosed on average 67.9 cases per year. The year 2011 marks the maximum number of 91 cases, while the lowest number of cases is in 2009 with 52 cases Table 1, Graph 1.

Distribution by age: As seen from the table in the first three decades of life there are no cases diagnosed with laryngeal cancer. It appears in the fourth decade of life, reaching the peak in the 6th decade and then declines [3,4]. Squamous cell carcinomas (SCCs) of the hypopharynx and larynx are uncommon malignancies, usually arising from dysplastic surface epithelium in patients older than 60 years, with the risk factors of smoking and alcohol Table 2, Graph 2 [5].

Distribution by gender: Of the 679 cases reported, 95.7% belong to male and only 4.3% are female. The male/female

Table 1: Distribution by years.

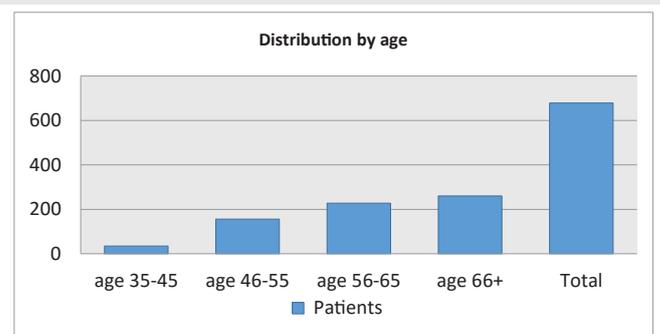
Years	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cases	72	69	72	53	67	68	58	52	77	91



Graph 1: Distribution by years.

Table 2: Distribution by age.

Nr	Age	Patients	%
1	age 35-45	35	5.2
2	age 46-55	156	23.0
3	age 56-65	228	33.6
4	age 66+	260	38.3
	Total	679	100



Graph 2: Distribution by age.



ratio is 22.2: 1. According to Stephenson and Perking this ratio is estimated to be very different ranging from 4: 1 to 20: 1 [6-9].

The British Cancer Research Center reports in 2011, following a detailed study, that in the United Kingdom the percentage of males diagnosed with laryngeal cancer is 82% and women 18%. So there is a big difference in the distribution of tumor to females in Britain and Albania. This can be explained by the fact that the beginning of smoking in UK women is earlier than ours Table 3, Graph 3.

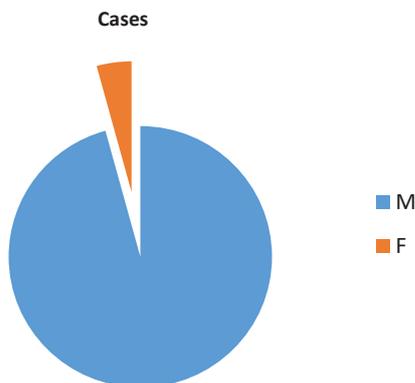
Distribution village/ town: From the tables we see that those who live in the city are more affected than those living in the village. Village percentage ratio: city is 44.5%: 55.5%. This report may not be very real, in the context of the major demographic changes that followed the 90s Table 4, Graph 4.

Distribution by profession: We have regrouped professions based on professional exposures, seeking to make a connection between the exposure and the prevalence of the disease Table 5, Graph 5 [10,11].

- Professionals that have contact with gasoline are: driver, tractor, generator, mechanic.
- The professions related to the mineral industry are: miner, geologist etc.
- Employees and others are: teacher, official, officer, economist, mercolog, financier, doctors, agronomist, writer, lawyer and engineer.
- Professions in contact with the wood: carpenter, woodworking, sawdust.
- Other workers are: workers, butcher, waiter, sailor, fisherman, barber, tailor, topographer, baker, technician, pastry, shoemaker.

Table 3: Distribution by gender.

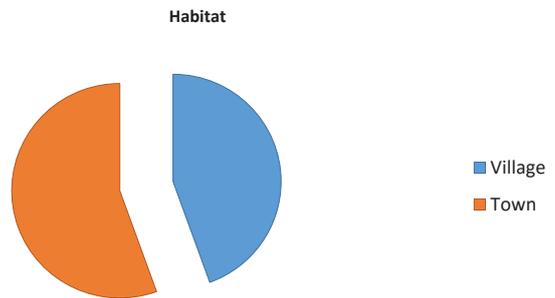
Gender	Cases	Percentage
Male	650	95.7%
Female	29	4.3%
Total	679	100%



Graph 3: Distribution by gender.

Table 4: Distribution by habitat.

Habitat	Village	Town
Cases	302	377
%	44.5	55.5



Graph 4: Distribution village/town.

- Workers working with metals are: copper mill, turntable, electrician, welder.
- Occupations exposed to toxic dusts are: masonry, carpenter, baker, farrier.
- Workers in agriculture: farmer, coachman
- Unclassified

From the above data, there are some interesting conclusions. We see that the highest percentage of those who worked in agriculture and workers. This is to some extent explained by the fact that exposure levels to the risk factors (tobacco, alcohol) of these persons are higher than those of intellectuals that account for 17.5% of total cases. On the other hand, they are part of low socio-economic levels, which is largely related to malnutrition. An interesting data comes from analyzing the up to a high percentage of professions that are in contact with the fuels we find in the figures of 16.8%. Hydrocarbons are known as potential carcinogenic factors. On the other hand, drivers are a community that consumes significant amounts of tobacco and alcohol, so that potentially carcinogenic effects are gained [10-12]. There are many studies that seek to find a link between occupational exposure and larynx cancer. Some studies by Golgberg, Gustavson or Bofetta also state that even people working in the mineral processing industry or dealing with metal processing are endangered to develop laryngeal cancer. However, in our study there is a link between these professions and this cancer. Professions as drivers, buffers, painters have a not very strong correlation with larynx cancer as quoted by Golgberg and Bofetta [11].

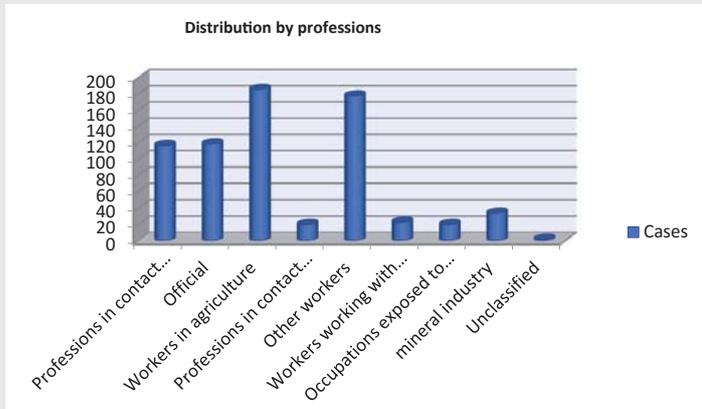
Tumor characteristics

Histological type: From the table data it seems quite obvious that the epidermoid carcinoma dominated by 99.5 % and rhabdomiosarcoma type 0.5 %. The classification of hitological type of our data is made according to World Health Organization's (WHO) Classification of Head and Neck Tumours Table 6, Graph 6 [5].



Table 5: Distribution by professions.

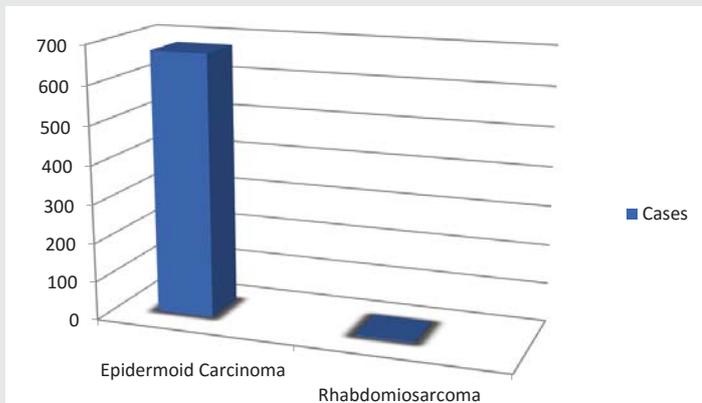
Professions by contact	Professions in contact with gasoline	Official	Workers in agriculture	Professions in contact with the wood	Other workers	Worker working with metals	Occupations exposed to toxic dust	Mineral industry	Unclassified
Cases	117	119	186	20	178	23	20	34	2
%	16.8	17.5	27.3	2	26.2	3.3	2	5	0.2



Graph 5: Distribution by professions.

Table 6: Histological type.

Type	Epidermoid Carcinoma	Rhabdomyosarcoma
Cases	676	3
Percentage %	99.5	0.5



Graph 6: Distribution by histological type.

Tumor localization at the moment of diagnosis: From the above data we see that tumor in glottis region is in 49.5% of cases, in supraglottic region 36.4 % of cases, in subglottic region 1.6 % and in transglottic region in 5,6% of cases. In the data postcricoid carcinoma is included in hypopharyngeal inferior carcinoma and marginal tumors are included in supraglottic carcinomas. According to the data presented by the National Institute of Carcinogenic Diseases in USA, 56.1% of cases with laryngeal cancer are in the glottic region, 32.7% in the supraglottic region and 1.4% in the subglottic Table 7, Graph 7.

Risk factors

Tobacco: According to international data, the percentage of

smokers is 85–95%. Our data are in line with those of literature. According to Talamini, 90% of the cases affected by laryngeal cancer are smokers Table8 , Graph 8 [12–17].

Alcohol: The major risk factors for SCC of the larynx are long-term tobacco exposure and alcohol abuse and have been long-established [18,19]. According to a European study and presented by Talamini, 58% of cases suffering from laryngeal cancer consume alcohol and 75% of cases are both tobacco and alcohol consumers. For alcohol consumption these data are not consistent with our study [10,12,17] Table 9, Graph 9.

Other risk factors: These data match Muscat, Wynder, or Zheng's studies that show that there is a connection between laryngeal cancer and various occupational professions related to the textile industry, chemical industries dealing with wood processing [11,20]. A small proportion of carcinomas appears to be related to transcriptionally active human papillomavirus infection, prognostic significance of this is not known at these sites [21]. In our 679 cases we don't have data that are connected with HPV as a cause of laryngeal cancer Table 10, Graph 10.

Clinical findings

The most commonly occurring sign in our patients is dysphonia (79.8%) followed by dysphagia (42.5%), dyspnea (25.4%), stridor (1.62 %) and rarest infestation is fetor, present only in 1 patient. Meanwhile, according to study data Done by Corle Bu Teaching Hospital Accra dysphonia was found in 75.5% of patients with dysphagia at 29%, dyspnea at 20%, stridor in 10.4 and neck mass at 7.8% Table 11, Graph 11 [22–24].

Staging. The extent of the tumor at the time of diagnosis

Staging criteria in Table 12, data collected of cancer staging uses the most recent UICC TNM staging (currently 8th version), which reflects the AJCC cancer staging for all criteria except for T3/T4a subglottic carcinomas. In the AJCC system, T3 carcinomas include those limited to larynx with vocal cord fixation and/ or invasion of paraglottic space and/or inner cortex of the thyroid cartilage. Normal (T1) or impaired (T2) vocal cord mobility and vocal cord fixation (T3) may only be determined clinically.

From the above data we see that in most cases of our cases, the laryngeal cancer is diagnosed in advanced stages III / IV. This proves a low level of early diagnosis of the disease, but also a silent tumor, which it might be diagnosed only when it is spread sufficiently. Perhaps these data point to our Albanian-Balkan character as careless of the disease. According to Jeffrey S.Moyer and Gregory T.Wolf, the third-fourth infiltration is 40% –50%, so no great compatibility with our study because of the two factors mentioned above Tables 12,13, Graph 12 [25,26].



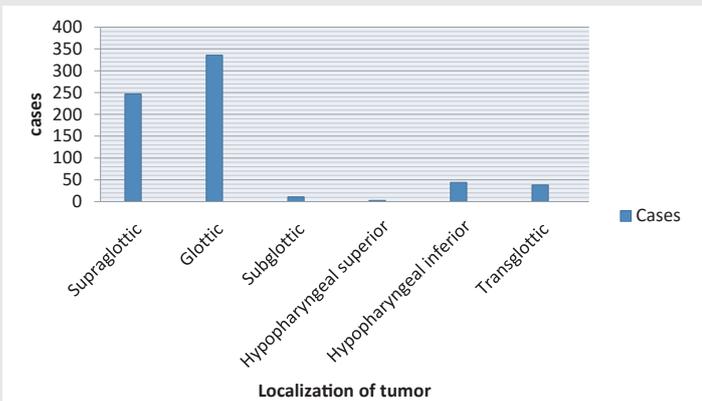
Treatment

Surgery: Table 13, Graph 13.

Surgery and its types: From our data we see that patients who undergo surgery are 38.09%. From the above data we see that the type of surgery most commonly used is laryngectomy that in most cases is associated with selective lymph node dissection. In this study stripping and mass excision are included in surgery type Cordectomy, which means that we have excised the tumor in stage IIa when the tumor is localized in one vocal fold. The surgery undergo is microlaryngoscopy and excision of the mass with Kleinsasser laryngeal scissors. Meanwhile no patient has undergone salvage surgery Table 14, Graph 14.

Table 7: Tumor localization.

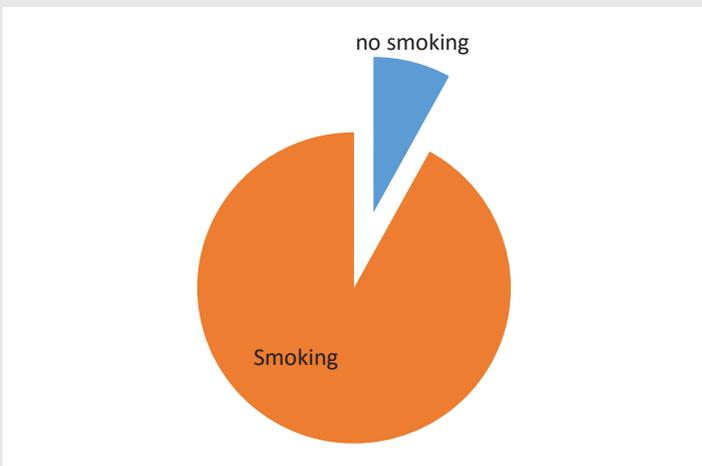
Localization	Supraglottic	Glottic	Subglottic	Hypopharyngeal superior	Hypopharyngeal inferior	Transglottic
Cases	247	336	11	3	44	38
Percentage %	36.4	49.5	1.6	0.4	6.5	5.6



Graph 7: Tumor localization.

Table 8: Smoking.

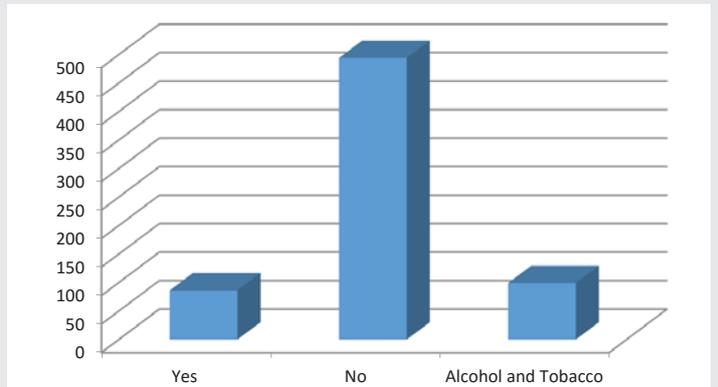
Smoking	Yes	No
Cases	630	49
%	92.8%	7.2%



Graph 8: Smoking.

Table 9: Alcohol consumption.

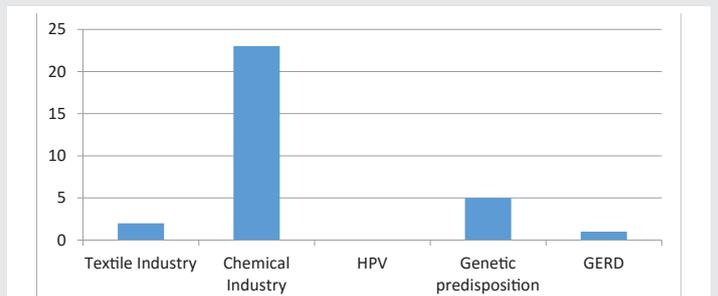
Alcohol consumers	Yes	No	Alcohol and Tobacco
Cases	86	494	99
%	12.6	72.7	14.6



Graph 9: Alcohol consumption.

Table 10: Other risk factors.

Other risk factors	Textile Industry	Chemical Industry	HPV	Genetic predisposition	GERD
Cases	2	23	0	5	1
%	0.29	3.3	0	0.7	0.14



Graph 10: Other risk factors.

Surgery/Radiotherapy/Chemotherapy: Of all the data we have for treatment, we see that patients who undergo surgery are 38.09%, while according to Marion and Cartei states that surgery was applied in 55% of patients. Also radiotherapy according to literature is used in more than 70% of patients and in our study is used at Table 15, Graph 15, 95%.

Surgery as a single treatment/ radiotherapy as a single treatment: As we see from the data only 9% of the patients underwent surgery as a single treatment otherwise 91% of them underwent radiotherapy as a single treatment. 233 of them underwent total laryngectomy. Those who underwent Cordectomy, Vertical Hemilaryngectomy and Horizontal Supraglottic laryngectomy, it was the only treatment without radiotherapy after surgery Table 16, Graph 16.

Radiotherapy only/Radiochemotherapy: There are 47 patients who have been treated with chemotherapy. Chemotherapy is used in 4.4% of cases versus 10% of literature Table 17, Graph 17 [24,27,28].



Discussions

Tobacco and alcohol

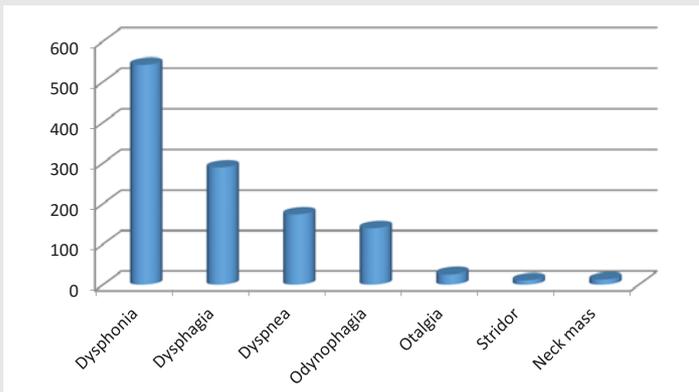
The importance of smoking exposure in the appearance of laryngeal cancer is a clear case for our study. Also, for alcohol exposure it can be said that there is a clear link. While the relationship between the two factors is commonly our study is not to produce any. The result of the simple fact because it requires more in-depth research [13,14,16,17].

Professions exposed as a result of work in the wood industry, rubber, textile or mineral industries

As in the literature and in our study there are several cases of laryngeal cancer that have worked in these industries. But despite these we can't judge for the consequent cause connection.

Table 11: Signs and symptoms.

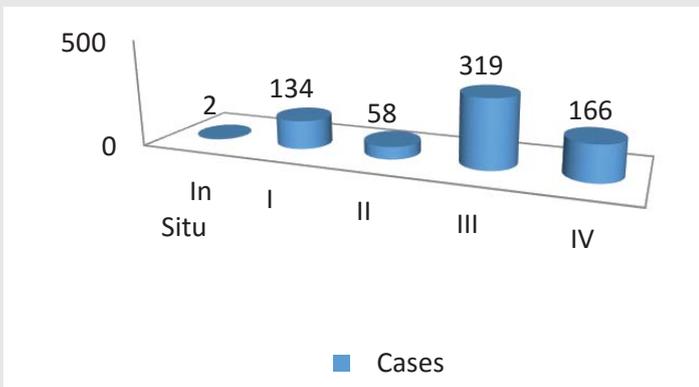
Signs and symptoms	Dysphonia	Dysphagia	Dyspnea	Odynophagia	Otalgia	Stridor	Neck mass	Fetor
Cases	542	289	173	139	26	11	13	1
%	79.8	42.5	25.4	20.4	3.8	1.62	1.91	0.16



Graph 11: Signs and symptoms.

Table 12: Staging for laryngeal cancer.

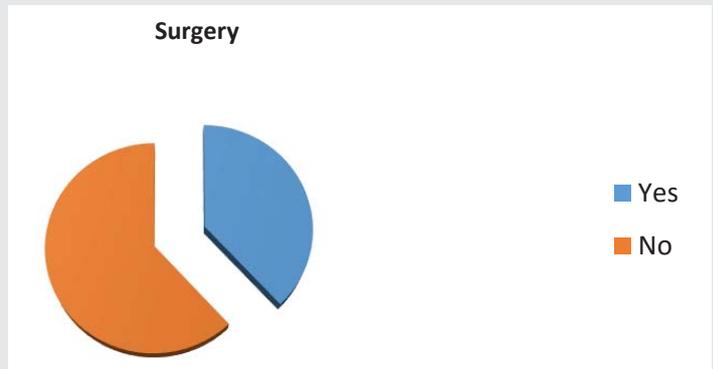
Stage	In Situ	I	II	III	IV
Cases	2	134	58	319	166
%	3	19.7	8.5	47.0	24.4



Graph 12: Staging for laryngeal cancer.

Table 13: Patients undergoing surgery or not.

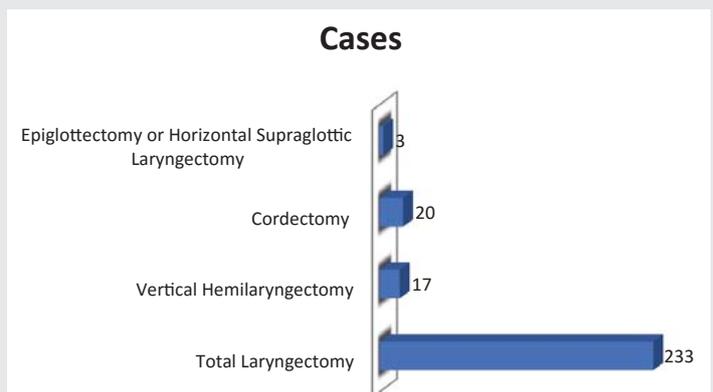
Surgery	Yes	No
Cases	256	423
%	38.09	62.2



Graph 13: Patients undergoing surgery or not.

Table 14: Surgery and its types.

Types	Total Laryngectomy	Vertical Hemilaryngectomy	Cordectomy	Epiglottectomy or Horizontal Supraglottic Laryngectomy
Cases	233	17	20	3



Graph 14: Surgery and its types.

Genetic

There are some cases that people diagnosed with laryngeal cancer have had close affiliation with this type of cancer, but despite that we are unable to say if there is a real cause connection [20,29].

HPV

In our study no case has been discovered that has been affected by HPV, but I believe that there has been 'failure to take this factor seriously' or even because this factor has not been detected as a cause.

Plummer-Vinson

In our study there are several cases with this syndrome but no tangible connection is detected.

Anemia

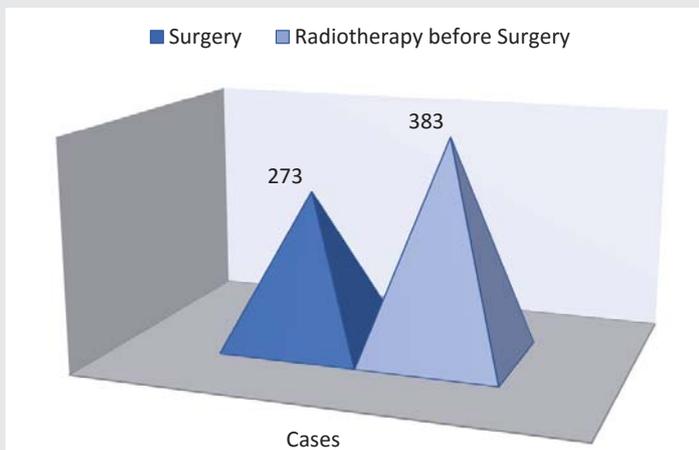
There are some cases of anemia, but this can be explained by the malnutrition or the lack of vitamins that potentially are the cause of laryngeal cancer [29–64].

Conclusions

Laryngeal cancer occurs with an incidence of 2.27 cases per 10,000 inhabitants and an average of 67.9 new cases per year. Incidence for male is 4.36 per 100.000 inhabitants, for female is 0.19 per 100.000 inhabitants. The incidence is low according to the changes that occurred in Albania in the 1990s, a large part of the Albanians had the opportunity to move abroad and be treated elsewhere. Also many cases can be treated in private hospitals, which further reduce the incidence.

Table 15: Surgery/Radiotherapy before surgery.

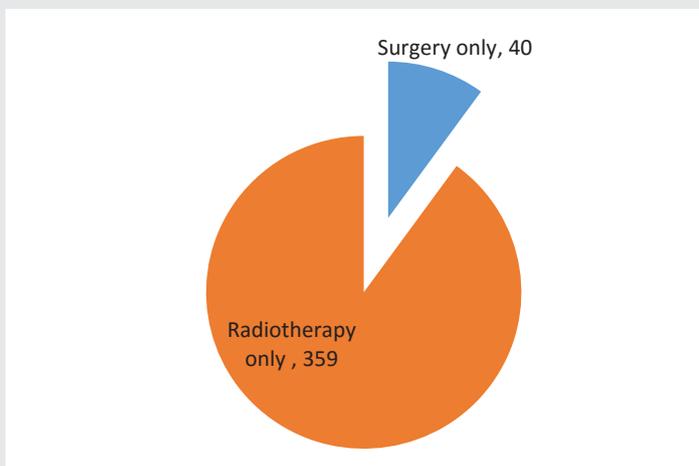
Treatment	Surgery	Radiotherapy before Surgery
Cases	273	383



Graph 15: Surgery/Radiotherapy before surgery.

Table 16: Surgery only/ Radiotherapy only.

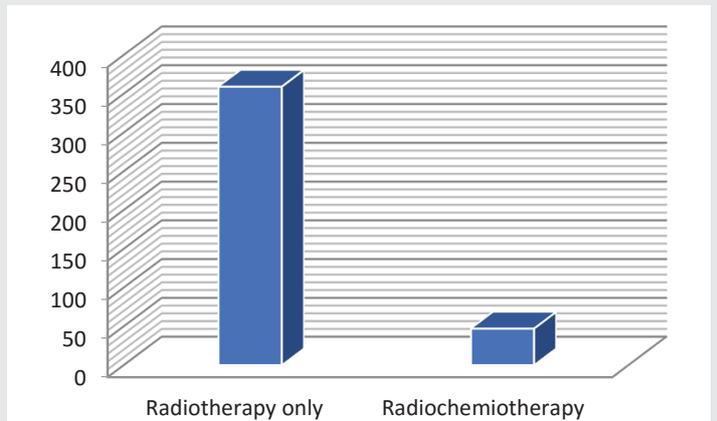
Treatment	Surgery only	Radiotherapy only
Cases	40	359



Graph 16: Surgery only/ Radiotherapy only.

Table 17: Radiotherapy only/ Radiochemiotherapy.

Treatment	Radiotherapy only	Radiochemiotherapy
Cases	359	47



Graph 17: Radiotherapy only/ Radiochemiotherapy.

In our study, we find more cases in the city than in the village. In our study 55.5 % of the individuals were living in urban zones while 44.5 % were living in rural zones. Because of the change of the regime in Albania, an internal migration occurred after the 1990s, many villagers were settled in the city and so we have no accurate result of the percentage of individuals living in the city and those living in the village for the occurrence of laryngeal cancer. Male to female ratio is 95.7 %/4.3%.

In the four first decades of life are recorded cases, while the age with the largest number of people affected is more than 66 years old (38. 3%) .In the first 30 years of life, we find no cases. The largest number of people affected is 60–70 years old.

About 92.8% of cases are consumers of tobacco, while 14.6 % of cases consume alcohol and tobacco both .It is found a link between tobacco and alcohol and the years of exposure to these two factors. Also there are cases affected by cancer of the larynx that work in mineral industry, wood processing, textiles and industries that have exposure to toxic dust. From this study, 319 of the cases (47%) at the time of diagnosis are in the third stage, 24.4% in the fourth stage, 19.7 % in the first stage, 8.5 % at the second stage. Dysphonia is the most common clinical finding in most of cases, followed by dysphagia. The most affected region is glottis 336 cases (49.5 %) followed by supraglottic region 247 cases (36.4%). In total treatment 40 patients underwent surgery only (cordectomy, Vertical Hemilaryngectomy and Horizontal Supraglottic laryngectomy).The most common treatment modality was radiotherapy as single treatment 359 cases (52,8%). Surgery in total 273 (37.7%) cases; Radiochemotherapy 47 (6.9%) cases.

In addition, we found that there is a link between exposure to wood, dust, or metal working in appearance of the laryngeal cancer. It is a task to detect the quantitative relationship between exposure years and this cancer. Also, the work should be deepened in HPV as a potential causative factor. In Albania



we see laryngeal cancer exclusively in smokers and alcohol abusers. We think that as a very important risk factor except smoking is a traditional Albanian alcoholic drink called "Raki". We conclude from our study that the incidence in women is lower compared to men because smoking is still taboo in Albania. Since primary prevention is not fully feasible then we need to focus more on secondary prevention or early psychology by coordinating activity between family practitioners and those specialists.

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