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ARTYKUŁ ORYGINALNY / ORIGINAL RESEARCH ARTICLE

The multicenter study result of diagnosis and treatment laryngeal carcinoma in Poland from 2001 to 2010

Wyniki wieloośrodkowych badań dotyczących diagnostyki i leczenia raka krtani w Polsce w latach 2001–2010

Authors' Contribution:
A – Study Design
B – Data Collection
C – Statistical Analysis
D – Manuscript Preparation
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Article history: Received: 15.03.2016 Accepted: 15.05.2016 Published: 16.06.2016

ABSTRACT:

Introduction: The laryngeal cancer is the most frequently diagnose malignancy in head and neck region. The highest morbidity is within male patients in the age range between 50 and 70 years. The multicenter study, coordinated by Otolaryngology Department of Medical University of Warsaw, was designed to investigate the epidemiology of laryngeal cancer in Poland from 1980 and to analyze the evolution of diagnostic and therapeutical procedures over the years.

Material and methods: There was performed retrospective analysis of the medical records of patients with laryngeal cancer hospitalized and treated in 12 otolaryngology centers in Poland from 2001 to 2010. The Microsoft Access 2003 (SP 2) platform was used to collect the data and subsequent statistical analysis.

Results: There were collected data from 4124 patients, 3682 men (89,3%) and 442 women (10,7%). The largest group consisted of patients in the age range between 50 and 60 years (41,5%) and the second large group was of those between 60 and 70 years (29,6%). The history of heavy cigarettes smoking was obtained from 81,3% of patients. Regarding the staging of laryngeal cancer, there were 1634 patients with cancer stage of I or II, including 5 patients with carcinoma in situ and 2490 patients with III or IV stage. The most frequent localization of the cancer was the glottis, followed with invasion of all three laryngeal levels and tumors occupying both the epiglottis and glottis. The majority of patients – 1367 (33%) – has the T3 tumor advancement. The lymph nodes metastases (N) were present in 1216 (29,5%) patients and among them the N2b and N2c advancement (lymph node larger than 6 cm, multiple) was detected in 533 of patients (13%). The lymph nodes involvement occurred in majority within advanced tumors of T3 or T4a. Considering the treatment options they varied depending on the staging of laryngeal cancer. The sole surgical procedures were performed in 73,7% of patients with cancer stage of I or II and in only 28.6% of patients with the

stage of III or IV. The advanced tumors were in majority treated with the combined therapy: surgery and radiotherapy. The overall survival in patients with cancer stage of I and II was 64% and 61% for those with stage III and IV.

Conclusions: The rate of laryngeal cancer detection is quite high in Poland, however the period from the onset of symptoms until diagnosis should be reduced. The effectiveness of surgical treatment is definitely unsatisfactory. The project to create a multicenter permanent base for monitoring the course of diagnosis and treatment in patients with laryngeal cancer surely will verify the procedures and enable to achieve better results. Continuation of this project is a task for all otorhinolaryngologists.

KEYWORDS: laryngeal carcinoma, epidemiology, clinical characteristics, multicenter study

STRESZCZENIE:

Wstęp: Rak krtani jest w Polsce najczęściej występującym nowotworem złośliwym regionu głowy i szyi. Rozpoznaje się go przede wszystkim u mężczyzn pomiędzy 50.–70. rokiem życia. Badania wieloośrodkowe, których celem było przedstawienie obrazu epidemiologicznego i klinicznego raka krtani, prowadzone były od 1980 roku. Obecne, koordynowane przez Klinikę Otolaryngologii WUM, mają za główny cel przedstawienie ewolucji procesu diagnostycznego i terapeutycznego.

Materiał i metody: Analizie retrospektywnej poddano dane dotyczące chorych diagnozowanych i leczonych z powodu raka krtani w latach 2001–2010 w 12 ośrodkach. Na platformie bazy Microsoft Access 2003 (SP 2) stworzono program do gromadzenia danych, które następnie poddano analizie statystycznej.

Wyniki: Zgromadzono dane dotyczące 4124 chorych, w tym 3682 mężczyzn (89,3%) i 442 kobiet (10,7%). Najliczniejszą grupę stanowili chorzy pomiędzy 50. a 60. rokiem życia – 41,5% oraz między 60. a 70. rokiem życia – 29,6%. Aż 81,3% pacjentów było nałogowymi palaczami papierosów. U 1634 chorych stwierdzono I i II stopień zaawansowania nowotworu, przy czym u 5 chorych był to rak in situ. U 2490 chorych zdiagnozowano III i IV stopień zaawansowania nowotworu. Najczęstszym umiejscowieniem raka były: głośnia, trzy piętra krtani oraz nadgłośnia i głośnia. Największą grupę stanowili pacjenci z rakiem krtani T3 – 1367 (33%). Węzły chłonne (cecha N) obecne były u 1216 chorych (29,5%). Największą grupę stanowiły węzły określane jako N2b i N2c, czyli powyżej 6 cm, oraz mnogie. Zdiagnozowano je u 533 chorych (13%). Węzły te występowały z rakami krtani określanymi jako T3 i T4a, a więc były to nowotwory zaawansowane miejscowo i regionalnie. Rodzaj zastosowanego leczenia bardzo różnił się w zależności od stopnia zaawansowania nowotworu. Sama chirurgia dotyczyła 73,7% pacjentów z nowotworem w stopniu I lub II, oraz jedynie 28,6% pacjentów z nowotworem w stopniu III lub IV. Nowotwory w zaawansowanych stadiach znacznie częściej były leczone terapią łączoną: chirurgią i radioterapią. Wyniki leczenia – mierzone przeżyciem całkowitym – wynosiły odpowiednio: w grupie chorych z zawansowaniem raka w I i II stopniu – 64%, w grupie chorych z zaawansowaniem raka w stopniu III i IV – 61%.

Wnioski: Skuteczność rozpoznawania raka krtani w Polsce jest duża, jednak skróceniu powinien ulec czas upływający od wystąpienia u pacjenta objawów do uzyskania diagnozy. Natomiast skuteczność leczenia chirurgicznego jest zdecydowanie niezadowalająca. Stworzenie stałej platformy do prowadzenia (i monitorowania) przebiegu diagnostyki i leczenia raka krtani, pozwoli na zweryfikowanie postępowania i osiągnięcie lepszych wyników. Jest to zadanie dla środowiska otorynolaryngologów.

SŁOWA KLUCZOWE: rak krtani, epidemiologia, charakterystyka kliniczna, badanie wieloośrodkowe

INTRODUCTION

The C32 laryngeal cancer constitutes the most frequently observed type of malignant neoplasm within the head and neck. According to the National Cancer Registry, the incidence rate for laryngeal cancer in Poland was 2200, and it included 1900 males and 300 females. Laryngeal cancer cases constitute 2.7% of new cases and the disease is the seventh most frequent cancer type, preceded by lung cancer – 23%, prostate cancer – 14%, colon cancer – 12%, bladder cancer – 7%, stomach cancer – 5% and kidney cancer– 4%. In females, laryngeal cancer cases constitute 0.4% of new cases and the cancer occupies a further place (for the purposes of comparison – breast cancer – 23%). The risk for developing laryngeal cancer is approximately 8 times higher in males than in females.

Laryngeal cancer is considered a nicotine-dependent type of neoplasm, and it constitutes a social issue in the society in which nicotine addiction is common. Diagnostics and treatment of patients with this type of cancer constitutes a large portion of procedures performed in laryngological clinics and departments. It should not come as a surprise then that a vast number of studies that present the outcomes of laryngeal cancer treatment in various centres were published. The first multi-centre studies were conducted between 1980 and 1985 as part of the PR-6 government programme, and Prof. Bolesław Semczuk was their coordinator. The topic of research: „Optimising methods for laryngeal cancer diagnostics and treatment" was realised during following years in three stages concerning diagnostics, treatment, radiation therapy and surgical treat-

Tab. I. The number of females and males at particular research centres.

	SCO	AML	UMB	RZ	ASK	UML	SLAMZ	WCO	UMP	UMK	WUM	GUM	TOTAL
F	15	22	15	33	11	20	62	12	94	50	70	38	442
M	305	298	199	403	125	180	512	96	612	317	443	192	3682
Total	320	320	214	436	136	200	574	108	706	367	513	230	4124

Tab. II. The distribution of patients' age at particular research centres in per cent values

	SCO	WCO	ASK	SLAMZ	GUM	UMB	UML	WUM	UMP	RZ	UMK	AML	TOTAL
(0,50)	6,2	10,3	10,3	11,0	12,2	13,8	15,1	15,4	16,4	17,1	18,0	19,4	14,4
(50,60)	46,6	51,4	50,7	42,9	35,2	31,4	45,2	42,2	44,7	37,8	38,0	36,1	41,5
(60,70)	31,9	20,6	25,7	34,0	30,4	34,3	27,6	27,1	26,8	30,0	31,7	28,8	29,6
(70,100)	15,3	17,8	13,2	12,2	22,2	20,5	12,1	15,2	12,1	15,2	12,3	15,7	14,6
Total	100,0	100,0	100,0	100,0	100,0	100,0	100.0	100,0	100,0	100,0	100,0	100,0	100,0

ment (Semczuk, 2001). The next attempt at preparing multi-centre data was made by Prof. Stanisław Bień who published a study concerning the epidemiological and clinical picture of laryngeal cancer between 1991 and 2001 in 2005 (Bień, 2005). During the 15th Symposium "Oncology in otolaryngology" in Warsaw in 2011, the idea for conducting further multi-centre studies concerning the efficacy of therapeutic laryngeal cancer treatment arose. The idea was put into life by the Board of the Oncological Section Team at that time who contacted the National Centre for Research and Development with the proposal in order to receive financial means needed to conduct the research project: "Preparation and introduction of laryngeal cancer treatment and diagnostics on the basis of multi-centre studies", which was accepted (No. 13-0101-10). Assoc. Prof. Ewa Osuch-Wójcikiewicz was the coordinator for the study.

MATERIAL AND METHOD

The material for the retrospective analysis comprised the data concerning the patients who were diagnosed and treated due to laryngeal cancer between 2001 and 2010 in 12 centres that took part in the execution of the project. Software for data collection was developed with the use of database platform Microsoft Access 2003 (SP 2) and given to the contractor. The software included questions about epidemiological data (sex, age, place of residence, addictions), data concerning diagnostics (duration time for all diagnostic stages, diagnostic methods), information concerning the location, stage and treatment of the cancer, recurrence and speech rehabilitation. Collected data were analysed statistically with the use of chi-square test, non-parametric Mann-Whitney-Wilcoxon and Kruskal-Wallis analyses, and rho-Spearman correlation coefficient.

RESULTS

Data concerning 4124 patients, including 3682 males (89.3%) and 442 females (10.7%) (Tab. 1) were collected. Significant differences in the number of diagnosed and treated patients with laryngeal cancer at particular centres were observed: the largest number of patients were treated at the following centres: Poznan (UMP) – 706, Zabrze (SLAMZ) – 574), Warsaw (WUM) – 513 and Rzeszów (RZ) – 436.

PATIENTS' AGE

The largest group comprised the patients aged 50-60 – 1697 patients, and 60-70 – 1212, which constituted 41.5% and 29.6% of the cases, respectively (Tab. 2).

HABITS

As many as 3355 patients (81.3%) were smokers: 1176 patients smoked less than 20 cigarettes daily, 2179 patients – more than 20 cigarettes, males 10 times more frequently than females (Tab. 3).

ALCOHOL

Alcohol consumption was declared by 1459 (35.4%) of the patients in the study population. Data analysis was performed separately for males and females, and it showed that 38% of males consumed alcohol, and almost 3 times fewer females – 13.8% - did so (Tab. 4).

Table 4: Relationship between alcohol addiction and sex – per cent distribution.

DISEASE SYMPTOMS

Hoarseness was the most frequently observed symptom, and it occurred in 3500 patients (85%). The following symptoms included: odynophagia (28.8%) and sore throat (28.2%). In a larger number of patients, several symptoms occurred concurrently (Tab. 5).

DIAGNOSTICS

Duration time for diagnostics was divided in the questionnaires into three periods: between the occurrence of the first symptoms and the first appointment, between the occurrence of the symptoms and the delivery of diagnosis, and between the diagnosis and the commencement of treatment. The period between the occurrence of the symptoms and the first appointment varied. In most cases the patients reported for the first appointment within 15-30 days of the symptom duration time - 1467 patients (35.6%), and within 8-14 days - 1046 patients (25.4%) (Tab. 6).

The period of time between the occurrence of the first symptoms and the delivery of the diagnosis was slightly different and was: 15-30 days in 1652 patients (40.1%), and 31-90 days in 999 patients (24.2%) (Tab. 7).

The period between the delivery of diagnosis and commencement of treatment was 1-3 days in 2133 patients (51.7%), and 4-7 days in 1005 patients (24.4%). A total of 618 (15%) patients were treated on the same day the diagnosis was delivered – the conclusion should be drawn that the diagnosis was made on the basis of the intra-operative examination (Tab. 8).

The most frequently performed diagnostic modalities included: micro direct laryngoscopy and direct laryngoscopy, and video laryngoscopy (Tab. 9), and the most frequently performed diagnostic imaging procedures included ultrasonography and CT of the neck (Tab. 10).

STAGE OF THE DISEASE

Stages I and II were diagnosed in 1634 patients, and in 5 cases it was in situ cancer. Stage III and IV was observed in 2490 patients. The differences between centres are significant. Data analysis shows that the most advanced stages of cancer are treated in Poland in the following centres: Warsaw, Zabrze, and Poznan, and early-stage cancer cases at the following centres: Poznań, Zabrze and Gdansk (it is shown in Tab. 12 in which the 5 patients with 0 stage were not included). These statistical differences are statistically significant (chi-square=404.37, p-value< 0.00001).

Tab. III. The relationship between smoking and sex.

	MALE	FEMALE	TOTAL
No nicotine addiction	679	90	769
Smoker, less than 20 cigarettes daily	1018	158	1176
Smoker, more than 20 cigarettes daily	1985	194	2179
Total	3682	442	4124

Tab. IV. Relationship between alcohol addiction and sex – per cent distribution.

DOES NOT DRINK	MALE	FEMALE	%
Does not drink	62,0	86,2	64,6
Drinks	38,0	13,8	35,4
Total	100,0	100,0	100,0

Tab. V. The occurrence of symptoms – distribution in particular groups of symptoms in per cent value

	HOARSENESS	COUGH	SORE THROAT	ODYNOPHAGIA	DYSPNEA
No	15,1	86,1	71,8	71,2	75,8
Yes	84,9	13,9	28,2	28,8	24,2
Total	100,0	100,0	100,0	100,0	100,0

The analysed data show that the location of laryngeal cancer within the glottis and within all three levels of the larynx is observed in the same number of cases. On the one hand it is an early-stage cancer that involved one region, on the other – advanced cancer in which all three levels of the larynx are involved (Tab. 13).

The largest group comprised the patients with T3 laryngeal cancer – 1367 patients (33%) (Tab. 14). A surprisingly large group comprised Tx patients, i.e. with the tumour that is impossible to evaluate. It results, most probably, from the misunderstanding of the TNM classification criteria or mistakes made during data insertion.

Lymph nodes (the N feature) were present in 1216 patients (29.5%). The largest group comprised the nodes described as N2b and N2c, i.e. larger than 6 cm, multiple, in total 533 patients (13%). These lymph nodes were observed concurrently with laryngeal cancer described as T3 and T4a, which means that in these cases the disease was advanced locally and regionally.

Distant metastases (the M feature) were observed in 9 patients at the T4a stage, and in 10 patients at the T4b stage.

Tab. VI. Time period until the first appointment at particular research centres.

	SCO	SLAMZ	UML	WUM	GUM	UMB	AML	UMP	UMK	ASK	RZ	WCO	TOTAL
The same day	0	0	0	2	1	1	4	34	23	10	236	102	413
[1,7] days	14	21	10	16	15	93	24	58	50	29	13	4	347
[8,14] days	149	159	55	82	68	66	106	192	75	35	57	2	1046
[15,30] days	138	272	84	200	88	37	121	309	129	23	66	0	1467
[31,90] days	17	105	42	206	35	17	54	112	74	30	56	0	748
[91,180] days	2	17	7	7	22	0	6	1	13	9	8	0	92
More than 6 months	0	0	2	0	1	0	5	0	3	0	0	0	11
Total	320	574	200	513	230	214	320	706	367	136	436	108	4124

Tab. VII. Time period until the delivery of the diagnosis at particular research centres.

	SCO	SLAMZ	UML	WUM	GUM	UMB	AML	UMP	UMK	ASK	RZ	WCO	TOTAL
The same day	0	0	0	0	1	1	4	34	22	10	226	99	397
[1,7] days	10	4	5	7	8	36	8	42	29	11	7	3	170
[8,14] days	112	77	24	52	43	87	77	161	59	35	50	6	783
[15,30] days	177	289	110	190	92	63	145	328	141	35	82	0	1652
[31,90] days	19	186	52	256	59	27	70	140	98	36	56	0	999
[91,180] days	2	18	7	8	26	0	9	1	13	9	13	0	106
More than 6 months	0	0	2	0	1	0	7	0	5	0	2	0	17
Total	320	574	200	513	230	214	320	706	367	136	436	108	4124

Tab. VIII. Time period until commencement of treatment at particular research centres.

	SLAMZ	SCO	AML	UMK	UMP	GUM	UML	ASK	UMB	RZ	WUM	WCO	Total
The same day	0	2	5	17	47	20	18	14	59	149	188	99	618
[1,3] days	428	178	192	179	526	96	47	83	124	209	65	6	2133
[4-7] days	125	116	91	128	119	98	59	23	20	62	161	3	1005
[8,14] days	20	12	15	33	10	12	61	12	6	8	70	0	259
[15,30] days	0	11	11	6	3	4	11	4	1	5	19	0	75
More than 1 month	1	1	6	4	1	0	4	0	4	3	10	0	34
Total	574	320	320	367	706	230	200	136	214	436	513	108	4124

Tab. IX. Endoscopic examination types.

	NUMBER
Nose fiberoptic endoscopy	126,00
Video laryngoscopy	1003,00
Video stroboscopy	674,00
Direct laryngoscopy	1267,00
Micro direct laryngoscopy	2184,00

Tab. X. Rodzaj badań obrazowych.

	NUMBER
Ultrasonography of the neck	2400,00
X-ray of the oesophagus	25,00
CT of the neck	1085,00
AngioCT	1,00
MRI of the neck	13,00
Angio MRI	2,00

Squamous cell carcinoma – 3228 patients (78%), and G2 differentiation – 759 cases constituted the prevailing histopathological diagnosis.

TREATMENT

The type of implemented treatment differed according to the stage of the cancer.

Mere surgery was performed in 73.7% of stage 1 or 2 patients, whereas only in 28.6% patients at stage 3 or 4. High-stage cancer cases were treated with the use of combined therapy: surgery and radiation therapy (Tab. 15).

The outcomes of treatment measured by total survival in the group of stage I and II patients are 64%, and in the group of stage III and IV – 61%. The differences in survival in particular periods depending on the stage are surprising. Data analysis shows that the differences between the studied groups are minor, and the outcomes are better for disease at higher stages for the majority of cases. Meticulous analysis of all factors that may influence the outcomes is necessary, as one reason for that may be the wrong classification of early-grade cancer cases for treatment (Tab. 16).

CANCER RECURRENCE

The period of time until recurrence is similar in both groups: low and high-grade stage cancer (Tab. 17).

Local recurrence in case of I/II stage cancer develops mostly within the larynx, in III/IV stage cancer within the larynx, lower pharynx and stoma (Tab. 18).

Late lymph node metastases were observed mostly in cases at stage III/IV, both on the same side where the tumour was located and contralaterally.

DISCUSSION

The conducted multi-centre study made it possible to present the current epidemiological and clinical picture of laryngeal cancer in Poland. The period of time that passes between data collection and its analysis and presentation is an imperfection of a retrospective study. Therefore, it is difficult to talk about the actual state to the fullest; data collection is also imperfect. Incomplete medical documentation, no possibility for accessing documentation (in some centres the contractors did not have access to the documentation from the whole period), and finally data insertion methods. The developed software guided through all stages in a clear and intuitive way it included „hints", e.g. the TNM system. Nevertheless, in many cases the data were incomplete, lacked, or were incredible. One of the main aims of the study was to compare some parameters, which are important from the clinician's point of view, with the ones showed in previous studies. And the basic question: Has improvement been achieved in the diagnostics and treatment of laryngeal cancer? Why are the achieved outcomes not satisfactory despite the huge advances in medicine? According to the National Cancer Registry, a downward tendency in the incidence and morbidity indices has been observed since the half of the 1990s, and these values are currently on a constant level with only a small difference between males and females. However, in Poland, the values of both indices are higher than the mean value for EU countries when compared to other European countries.

The analysed material comprised 4124 cases, a significantly smaller group than the one analysed by Bień - 11 884 (data from 19 centres from 1991-2001 (Bień, 2005)). The M:F ratio was 8:1 and peak incidence was observed for patients aged 50-60 – 1967 cases, and 60-70 – 121, 41.5% and 29.5%, respectively. The data are similar, according to the NCR. More than 81% of the patients smoked, and 2/3 of them smoked more than 20 cigarettes daily. It is slightly less than in the material collected by Semczuk (579 patients from 1988-1989), in which 97% were nicotine addicts (Semczuk, 1998).

Hoarseness was the most frequently observed symptom, and it occurred in 3500 patients (75%), however, the vast majority of patients reported to their family doctor (62%). The analysis of the material showed that the diagnostic process takes too long: in 61% of the patients the period of time between the occurrence of first symptoms and the first appointment was 8-30 days, in 64.3% - the time period between the occurrence of first symptoms and the delivery of the diagnosis is 15-90 days. Only the time period between the delivery of diagnosis and commencement of treatment is 1-7 days in 76.1% of the patients, and these results show a great potential of laryngological centres, among which Departments in Poznan, Warsaw, Zabrze, Rzeszów and Bydgoszcz excel.

In the study by Borejko and Cichocka-Szumilin published in 1966, when discussing the causes for delay in the diagnostics of laryngeal cancer, on the basis of analysing 323 medical history notes, the authors showed that the period of time during which the symptoms were present until the appointment was 11 weeks, and between the moment when the symptoms first occurred and the diagnosis was made – 20 weeks! Only 20% of the patients reported to the laryngology specialist. The authors point out that the conservative treatment used by gen-

Tab. XI. The stage of the disease at particular research centres

	ASK	RZ	SCO	SLAMZ	UMB	UMK	UML	WCO	WUM	AML	UMP	GUM	TOTAL
Stage 0	0	0	0	0	0	0	0	0	0	1	3	1	5
Stage I	56	48	73	67	51	54	66	24	67	79	202	181	968
Stage II	21	73	49	123	35	60	38	11	44	53	130	24	661
Stage III	32	214	64	114	56	134	51	24	156	97	191	12	1145
Stage IV	27	101	134	270	72	119	45	49	246	90	180	12	1345
Total	136	436	320	574	214	367	200	108	513	320	706	230	4124

Tab. XII. The number of particular stages of laryngeal cancer at research centres in per cent.

	NUMBER: STAGE I/II	NUMBER: STAGE III/IV	PROCENT: STAGE I/II	PROCENT: STAGE III/IV	PART: STAGE I/II	PART: STAGE III/IV
UMK	114	253	31,1	68,9	7,0	10,2
GUM	205	24	89,5	10,5	12,6	1,0
ASK	77	59	56,6	43,4	4,7	2,4
RZ	121	315	27,8	72,2	7,4	12,7
SLAMZ	190	384	33,1	66,9	11,7	15,4
SCO	122	198	38,1	61,9	7,5	8,0
UMB	86	128	40,2	59,8	5,3	5,1
UML	104	96	52,0	48,0	6,4	3,9
AML	132	187	41,4	58,6	8,1	7,5
UMP	332	371	47,2	52,8	20,4	14,9
WUM	111	402	21,6	78,4	6,8	16,1
WCO	35	73	32,4	67,6	2,1	2,9
Total	1629	2490	39,5	60,5	100,0	100,0

Tab. XIII. The location of laryngeal cancer

LOCATION	FEMALE	MALE	TOTAL	
Supraglottis	83	511	594	14,40%
Glottis	101	1038	1139	27,61%
Supraglottis+glottis	148	886	1034	25,0%
Glottis+infraglottic cavity	13	187	200	4,85%
Supraglottis+Glottis+infraglottis	95	1044	1139	27,61%
Infraglottis	2	16	18	0,44%
Total	442	3682	4124	100%

eral practitioners is the main cause for the delay in laryngeal cancer diagnostics. The laryngologist established the diagnosis within 2 weeks in 85% of the cases (Borejko, 1966).

Klonowski, in a publication from 1986, showed that in the group of 1160 patients analysed and treated due to laryngeal cancer between 1980 and 1984 mean time period between the occurrence of the first symptoms and the delivery of diagnosis varied from 184 to 229 days (26-30 weeks) (Klonowski, 1986).

The study by Semczuk (579 patients from 1988-1989) showed that the mean time of diagnostics was: up to 3 months in 32% of the cases, 3-6 months in 35% of the cases, 6-9 months in 9.2% of the cases, and over 18 months in 8.1% of the patients (Semczuk, 1998).

Tab. XIV. Stages of laryngeal cancer according to the TNM system

T	N0	N1	N2A	N2B	N2C	N3	TOTAL
Tis	5						5
T1a	833	12	3				848
T1b	102	2	1				105
T2	618	53	9	33	18	3	734
T3	879	153	55	137	121	22	1367
T4a	343	105	97	129	146	37	857
T4b	15	8	16	14	17	25	95
Tx	113						113
Total	2908	333	181	313	302	87	4124

Tab. XV. Treatment type

	NUMBER: STAGE I/II	NUMBER: STAGE III/IV	PROCENT: STAGE I/II	PROCENT: STAGE III/IV	PART: STAGE I/II	PART: STAGE III/IV
No surgery	0	46	0	100,0	0	1,8
Other type of surgery	0	33	0	100,0	0	1,3
Surgery	1200	712	62,8	37,2	73,7	28,6
Surgery and radiation therapy	123	1415	8,0	92,0	7,6	56,8
Radiation therapy and chemotherapy	13	100	11,5	88,5	0,8	4
Radiation therapy, chemotherapy, and surgery	0	17	0	100,0	0	0,7
Radiation therapy	293	142	67,4	32,6	18,0	5,7
Radiation therpy and surgery	0	25	0	100,0	0	1
Total	1629	2490	39,5	60,5	100,0	100,0

Tab. XVI. Survival depending on the stage of the disease

SURVIVAL TIME	LICZBA PACJENTÓW: STOPIEŃ I/II	LICZBA PACJENTÓW: STOPIEŃ III/IV	PROCENT PACJENTÓW: STOPIEŃ I/II	PROCENT PACJENTÓW: STOPIEŃ III/IV	UDZIAŁ PACJENTÓW: STOPIEŃ I/II	UDZIAŁ PACJENTÓW: STOPIEŃ III/IV
More than 10 years	86	111	43,7	56,3	8,2	7,3
More than 9 years	45	56	44,6	55,4	4,3	3,7
More than 8 years	74	84	46,8	53,2	7,1	5,5
More than 7 years	64	64	50	50	6,1	4,2
More than 6 years	82	104	44,1	55,9	7,8	6,8
More than 5 years	137	133	50,7	49,3	13,1	8,7
More than 4 years	132	134	49,6	50,4	12,6	8,8
Survival time between 3 and 4 years	165	184	47,3	52,7	15,7	12,1
Survival time between 2 and 3 years	127	185	40,7	59,3	12,1	12,1
Survival time between 1 and 2 years	95	237	28,6	71,4	9,1	15,5
Survival time shorter than 1 year	41	233	15	85	3,9	15,3
Total	1048	1525	40,7	59,3	100,0	100,0

Tab. XVII. Time period until the occurrence of recurrence.

	Number: Stage I/II	Number: Stage III/IV	Procent: Stage I/II	Procent: Stage III/IV	Part: Stage I/II	Part: Stage III/IV
Brak informacji o okresie do stwierdzenia wznowy	19	16	54,3	45,7	5,2	5,3
Powyżej 36 miesięcy	53	29	646	35,4	14,6	9,6
Od 24 do 36 miesięcy	38	25	60,3	39,7	10,4	8,3
Od 12 do 24 miesięcy	85	61	58,2	41,8	234	20,1
Od 6 do 12 miesięcy	101	98	50,8	49,2	27,7	32,3
Do 6 miesięcy	68	74	47,9	52,1	18,7	24,4
Razem	364	303	54,6	45,4	100,0	100,0

Tab. XVIII. Recurrence location

	NUMBER: STAGE I/II	NUMBER: STAGE III/IV	PROCENT: STAGE I/II	PROCENT: STAGE III/IV	PART: STAGE I/II	PART: STAGE III/IV
No	39	126	23,6	76,4	10,7	41,6
Lower pharynx	13	41	24,1	75,9	3,6	13,5
Larynx	301	87	77,6	22,4	82,7	28,7
Oesophagus	2	11	15,4	84,6	0,5	3,6
Stoma	9	38	19,1	80,9	2,5	12,5
Total	364	303	54,6	45,4	100,0	100,0

Tab. XIX. Late lymph node metastases.

	NUMBER: STAGE 1/2	NUMBER: STAGE 3/4	PROCENT: STAGE 1/2	PROCENT: STAGE 3/4	PART: STAGE 1/2	PART: STAGE 3/4
No metastases	289	149	66	34	79,4	49,2
Ipsilaterally (in relation to the tumour)	64	125	33,9	66,1	17,6	41,3
Contralaterally	11	29	27,5	72,5	3	9,6
Total	364	303	54,6	45,4	100,0	100,0

When comparing the analysed material, it can be assumed that a twofold decrease in the time needed for laryngeal cancer diagnostics, on average from 6 to 3 months, was achieved, but this time period is still too long if one takes into account that the studies were conducted 20 years apart from each other.

The available methods for laryngeal diagnostics are not used in the diagnostic process of laryngeal carcinoma to the fullest, even in clinical centres. Micro direct laryngoscopy and direct laryngoscopy prevail significantly. The fact that video laryngoscopy and video stroboscopy are more and more commonly used in cases of glottic cancer (1003 + 674 = 1677 / 1139) is a positive piece of information. When it comes to diagnostic imaging procedures, computed tomography was performed in too few patients, when the stage of the disease is taken into account (1085/4124 cases). Nose fiberoptic endoscopy on the other hand, an excellent tool for the purposes of advanced cancer evaluation, was performed in 126 patients only !!! Also, CT is not used, and it is inevitable for the evaluation of laryngeal cancer extension, and, at the same time, for establishing the correct decision concerning treatment – it was performed only in 1085 / 2224 patients at T3 and T4 !!! Endoscopic examination is indicated by the European Laryngological Society for the diagnostics of early glottic cancer, and CT is included in the standards of diagnostic-therapeutic protocol.

The analysed material showed that, in comparison with the previous years, the clinical picture of laryngeal cancer changed – glottis was involved by the neoplasm in 27.61% of the cases, the supraglottis in 25% of the cases, and three levels of the larynx – in 27.61% of the cases. Between 1980 and 1984, the supraglottis was the prevailing location - 43% of the patients (Klonowski, 1986), between 1988 and 1989 supraglottis and glottis were involved in almost 50% of the patients, Semczuk,

1998), and between 1991 and 2001 the cancer was located within the glottis in 47.6% of the patients, and within the supraglottis in 40% of the patients (Bień, 2005).

Early-stage cancer (I and II) was diagnosed in 1634 patients (39.5%), and in situ cancer was observed in 5 cases. Stage III and IV was observed in 2490 (60.4%) patients. Disparities between centres are very large, high-grade cases constitute 10% of the cases in Gdańsk, whereas in Warsaw they constitute 78%.

The choice of treatment method depended on the stage of the cancer. Surgical treatment was implemented in 73.7% of stage I and II cancer patients, in 85.4% of stage III or IV cases, and: surgical treatment and radiation therapy were used in 56.8% of the cases, and sole surgical treatment in 28.6% of the cases. Stage I and II patients were treated mostly surgically (1323/1629 patient) – endoscopically with the use of CO2 laser – 43.8%, partial surgery– 26%, classic chordectomy from the external approach – 18%, and total laryngectomy was performed in 12% of the cases. Stage III and IV patients were treated mostly using the combined approach: surgical treatment and radiation therapy. Total laryngectomy was the most frequently performed type of surgery (77.1%). In 69% of the patients (1720/2490), neck lymph node dissection was also performed, in most cases – of the bilateral selective type.

Klonowski states that between 1980-84, stage III or IV was observed in 64.2% of the patients, and the treatment implemented included: surgical treatment in 58.1% of the patients, radiation therapy in 34.8% of the cases, and combined treatment in 4.2% of the patients. The type of surgery and treatment outcomes are not reported (Klonowski, 1986).

In the study by Semczuk, the largest group comprised stage III patients – 64.6% of the patients, IV – 17.6% of the patients, which means that high-stage cases are 82.2% of the cases. Stage I and II was observed in 17.8% of the cases, only. The majority of patients were treated surgically – total laryngectomy was performed in 72% of the cases, partial surgery in 24.2% of the cases, and lymph node dissection was performed in more than 34% of the patients. 48.2% of the patients were referred for post-operative radiation therapy (Semczuk 1998).

The data analysed by Bień showed an upward tendency in the T3 stages of supraglottic cancer, and the decrease in the number of cancer cases located within the glottis, with a concurrent increase in the tendency for T1, T2 glottic cancer occurrence (Bień, 2005)

When comparing the above-mentioned data, it should be noted that stage I and II cancer cases, which were treated endoscopically with the use of CO2 laser or partial surgery, were significantly more frequently diagnosed between 2001 and 2010. Advanced cases constituted 60.4% of the patients and, although the number was smaller than in the previous years, they are the prevailing group. These neoplasms were treated mostly with the use of the combined method: surgical treatment and radiation therapy. Total laryngectomy was performed in as many as 77% of the cases, more frequently than in the group of patients from 1988-1989.

Research studies from 1980-1984 showed that the 3-year survival after mere surgical treatment is over 70%, and 58% after combined treatment – surgery and radiation therapy.

The studies from 1988-1989 showed that 72% of the patients survived 3 years without active neoplastic process after surgery, and 59% of the patients – 5 or more years. The authors did not report whether there was a relationship between the stage of the disease but the data differs from the contemporary data – stage I and II patients comprised 17.8% of the cases, and stage III and IV were observed in the remaining part.

The results of the current studies showed that 10-year survival constitutes, in total, 62.5% of the cases, and for stage I, II – 64.3%, and stage III, IV – 63.8%, worse in the group in stage I and II – 53.4% of the patients. The above-mentioned results are significantly different from the previously acquired. It is not comprehensible why long-term results in early stages of laryngeal cancer are that unsatisfactory. When analysing the number of recurrence cases that were observed in 22.3% of the cases (up to 6 m – 18.7%, 6-12 m – 27.7%, 12-24 m – 23.4%) after endoscopic surgical procedures of the glottic cancer were performed, with the use of laser in most of cases (580/1323 surgical procedures), one should think about, analyse and discuss the indication for this surgery type performed at particular centres.

Recurrence was observed in 667/4124 patients – 16.2%, in most cases within the first two years after surgery: in stage I and II cases in 364/1629 patients – 22.3% , in stage III and IV in 303/2490 cases – 12.2%.

CONCLUSIONS

The efficacy of laryngeal cancer diagnostics is high in Poland. However, the time period between the occurrence of the symptoms until the delivery of diagnosis should be shorter. It seems that the patients are not referred by their family doctor to the specialist soon enough. Polish Society of Otolaryngologists and Head and Neck Surgeons takes part in the education of family doctors in a broad sense by taking part in congresses, conferences and training sessions dedicated for the general practitioners. These training courses became more important in the light of the organisational changes concerning the care for laryngeal cancer patients – the majority of patients, even those treated primarily using radiation therapy, are

referred for check-up appointments to their family doctors even 3 months after oncological treatment has been completed.

Micro direct laryngoscopy remains the basic examination that makes it possible to acquire material for microscopic evaluation in diagnostics, and this approach should be obligatory in each otolaryngological department. Definitely, too few examination procedures that facilitate the evaluation of cancer extension, particularly computed tomography, are undertaken.

The efficacy of surgical treatment is definitely unsatisfactory. When comparing the outcomes of treating advanced cancer cases with early stage cancer cases, there is no difference visible. The outcomes of treatment for early laryngeal cancer are significantly different from the ones observed in the previous analysed periods and are not in accordance with the outcomes published in international literature. w. Low efficacy of treating early stage laryngeal cases requires discussion by the Heads of Departments and the members of the Polish Society of Otolaryngology, Head and Neck Surgery. The number of recurrence cases after endoscopic glottis surgery is particularly worrying. The popularisation of using the CO2 laser as the surgical blade has made this method a popular choice in various centres. And even though the principles and indications are clearly described by the European Laryngological Society, the acquired outcomes show that they are misunderstood or, the patients are qualified for surgery too promptly and too hastily. One solution for that could be to organise training sessions and courses for laryngologist who practice endoscopic surgery by the centres that have the most experience and qualifications when it comes to the use of laser surgery in the treatment of early laryngeal cancer: The Department in Poznań, Warsaw, or Gdańsk.

It is crucial that a constant platform and a constant system for real-time monitoring of the course of diagnostics and treatment of laryngeal cancer be developed. The development of a website within the execution of the project that can be used later on for further goals may be the first step towards this aim.

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Word count: 4700 Tables: 19 Figures: – References: 5

Access the article online: DOI: 10.5604/20845308.1201900 Full-text PDF: www.otorhinolaryngologypl.com/fulltxt.php?ICID=1201900

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Competing interests: The authors declare that they have no competing interests.

Funding: Praca powstała w ramach realizacji projektu rozwojowego Nr 13-0101-10 finansowanego z funduszy Narodowego Centrum Badań i Rozwoju.

Cite this article as: Osuch-Wójcikiewicz E., Bruzgielewicz A., Majszyk D., Łuczaj J., Pawlak-Osińska K., Stodulski D., Pomarańska M., Kaczmarczyk D. Leszczyńska M., Domka W., Miśkiewicz-Orczyk K., Postuła S., Golusiński P., Piotrowicz M., Niemczyk K.: The multicenter study result of diagnosis and treatment laryngeal carcinoma in Poland from 2001 to 2010; Pol Otorhino Rev 2016; 5(2): 1-11