

ORIGINAL STUDY

**THE EVALUATION OF RADIOTHERAPY TOLERANCE OF
ELDERLY PATIENTS WITH HEAD AND NECK CANCERS**

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ABSTRACT

To analyze in a retrospective study the radiotherapy tolerance of patients with head and neck cancers, over 70 years old. This study involves 77 patients with head and neck tumors, treated between January 2006 and December, 2008 in the Radiotherapy Department of Emergency County Hospital "St. Ap. Andrew", Galati. 66 patients were men and 11 were women, the mean age was 75.44 years (range 70-96 years), performance status ECOG 0-3. External beam radiotherapy (EBRT) was effectuated at the radiotherapy machines Theratron Elite 100 and Rokus M 40, conform existent treatment protocols, with total doses, DT = 66 – 77Gy/ primary tumor, regarding regional extension, standard fractionation, dose/fr. = 180 or 200cGy, function of target volume and DT = 50Gy/ lymph nodes, with bolus on affected lymph nodes until 60Gy. We did not made treatments with modified fractionation neither concurrent chemo-radiotherapy, on age and comorbid illnesses criteria. Were analyzed the mucositis, hematological and skin acute reactions. the most frequent were larynx cancer with 24 cases (31.17%), followed by oral cavity with 21 cases (27.2%), oropharynx -16 cases (20,7%), maxillary sinuses – 6 cases (7.79%), salivary glands – 4 cases (5,19%), nasopharynx – 3 cases (3.9%) and hypopharynx - 3 cases (3.9%). Conforming WHO scale, oral mucositis grade 1, 2 and respective 3 had 32 patients (41.54%), 18 patients (23.3%) and respective 27 patients (35.08%). Weight loss occurred at 86% of all studied patients. 62 patients (80.5%) terminate treatment with total doses. 19.3% of patients interrupted the treatment because of non-compliance (2.5% of cases), comorbid illnesses (3.8% of cases) and grade 3 oral mucositis (13% of cases), which required hospitalization and supportive care therapy. Skin reactions were manifested at the end of the treatment but did not require the interruption of treatment. We did not register anemia, leucopenia and thrombocytopenia in EBRT course. The head and neck tumors radiotherapy involves high toxicities of mucosa. Even our patients had advanced stages disease, who required higher target volumes, over 2/3 of studied patients terminated EBRT at purpose radiation doses, with acceptable toxicities without major toxicities or deaths. Performance status and the severity of comorbid illnesses are limiting the old patient's radiotherapy tolerance.

KEYWORDS: neck cancers, chemo-radiotherapy, complications

1. Introduction

In the last years, once with hope of life increasing, it was registered an increased number of ORL cancers, in the world and also in our country. ORL cancers represent a heterogeneous group of tumors – oral cavity, oropharynx, hypopharynx,

nasopharynx, larynx, salivary glands, thyroid, and maxillary sinuses. Had and neck tumors represent almost 5% of total cancers. The alcohol consumption and smoking represent the main risk factors.

The predominant histology is represented by squamous-carcinoma. It is known that more aggressive treatment regimes, concomitant chemo-

radiotherapy, lead to local control and survival increasing, but superior results regarding local control are obtained with the price of an increased morbidity reported as secondary treatment toxicity from whom we are mention the mucositis with negative impact on quality of life.

Five years survival, for locally and regionally advanced had and neck cancers is modest with all agresive multimodal treatments and it is reported being of <20% with a mean rate of survival <12 months [2,3,4].

Scope: This study wants to analyze the tolerance at external beam radiotherapy of patients over 70 years old with had and neck cancers, to analyze the acute mucous, skin and hematological reactions, and also the treatment compliance and comorbid illnesses.

2. Material and methods

This retrospective study involves 77 patients with mean age 75.44 years (range 70-96 years), treated between January 2006 and December, 2008 in the Radiotherapy Department of Emergency County Hospital "St. Ap. Andrew", Galati. This lot represents 13.18% of total of 584 had and neck cancer patients, who performed radiotherapy, in analyzed period. Patient characteristics are described in Table I. The male patients represent the majority of analyzed patients. The entire lot of patients was divided in three age subgroups: 70-80 years, 81-90 years and over 90 years. The most of them being in the 70-80 years age subgroup.

Regarding localization's distribution these were: larynx cancers with 31.17% of cases, followed by oral cavity cancers with 21 cases (27.27%). All analyzed patients came for performing treatment in our department, with III and IV stage of disease; in III stage were 61 patients (79.22%) and 16 patients (20.78%) being in IV stage of disease, T₄N₁, without

distance metastasis. At presentation in the radiotherapy department, the main symptoms were pain (90% of cases) and dysphagia in different grades for 80.52% of patients.

The external beam radiotherapy was effectuated at Theratron Elite 100 and Rokus M 40 installations, conforming actual protocols, with total doses between 66 and 70Gy/ primary tumor, respect of locally-regionally extension, in standard fractionation, with dose / fraction = 180 or 200cGy respect of the size of target volumes and total dose 50Gy/ lymph nodes target volumes, with boost on interest lymph nodes until total dose of 60Gy. We did not performed modified fractionation treatment.

Because of age and comorbid illnesses criteria, concomitant chemo-radiotherapy treatment (RT-CHT) was not administrated.

The following toxicities: oral mucositis, dysphagia, stomatitis, post-irradiation pharyngitis, hematological and skin reactions were analyzed. For the assessment of mucositis' grade we used the World Health Organization (WHO) scale [5], table II.

3. Results

Mucositis grade 1, 2 and respective 3 had 32 patients (41.56%), 18 patients (23.38%) and respective 27 patients (35.06%). 62 patients (80.52%) finished their treatment at total proposed doses, 19.3% of cases interrupted the treatment because of:

- Non-compliance in 2.6% of cases; 2 patients interrupted their treatment at doses of 18 and respective 24Gy, for personal reasons.
- Cobormid illnesses in 3.9% of cases (acute coronary disease, stroke, renal insufficiency),
- Grade 3 mucositis in 13% of cases.

Although has been 27 patients that presented grade 3 mucositis, for 10 (13%) of the 27 patients the radiotherapy was interrupted at doses of 40Gy and respective 50Gy for 4 and respective 6 patients.

Table I. Patient characteristics

Characteristics	Total =77	
	n	%
Age groups		
- 70-80 years	66	85.72
- 81-90 years	10	13
- > 90 years	1	1.3
Sex		
- Male	66	85.72
- Female	11	14.28
Localization		
- Oral cavity	21	27.27
- Nasopharynx	3	3.9
- Oropharynx	16	20.78
- Hypopharynx	3	3.9
- Larynx	24	31.17
- Salivary glands	4	5.19
- Maxillary sinuses	6	7.79
Stages		
- Stage I and II	0	0
- Stage III	61	79.22
- Stage IV	16	20.78
Histology		
- Squamous carcinoma	73	94.81
- Cystic adenoid carcinoma	3	3.9
- Undifferentiated carcinoma	1	1.3
Grading de differentiation		
- G1	62	80.52
- G2	6	7.79
- G3	8	10.38
- G4	0	0

Table II. The WHO scale the assessment of mucositis grade

Grade	0	1	2	3	4
Symptoms' description	None	Soreness ± erythema	Erythema, ulcers and patient can swallow solid food	Ulcers with extensive erythema and patient cannot swallow solid food	Mucositis to the extent that alimentation is not possible - Hemorrhage

Table III. The acute toxicities

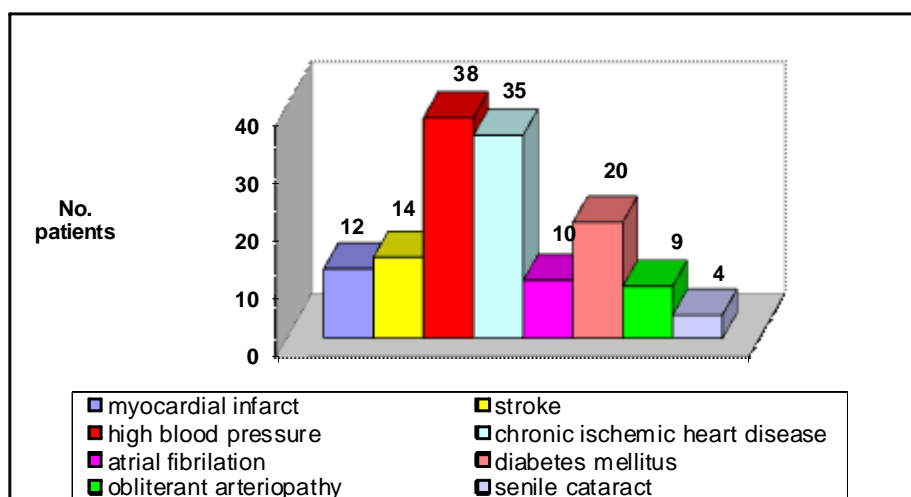
Type of toxicity	Mucositis (scale WHO)			Dysphagia	Weight loss
	Grade 1	Grade 2	Grade 3		
Nr. patients	32 (41.54%)	18 (23.38%)	17 (22.07%) [complete treatment] 10 (13%) [incomplete treatment]	62 (80.52%)	66 (85.71%)

Table IV. *Causes of treatment interruption*

No. patients	Causes of treatment interruption
2 (2.6%)	Non - compliant
3 (3.9%)	Comorbid illnesses
10 (13%)	Grade 3 mucositis

Table V. *Associated comorbid illnesses*

Associated diseases	No. patients
Previous myocardial infarct	12 (15.58%)
Previous stroke	14 (18.18%)
High blood pressure	38 (49.35%)
Chronic ischemic heart disease	35 (45.45%)
Atrial fibrillation	10 (12.99%)
Decompensated diabetes mellitus	20 (25.97%)
Obliterant arteriopathy	9 (11.69%)
Senile cataract	4 (5.19%)

**Figure 1.** *Associated comorbid illnesses*

These patients required supportive therapy with nutritional back up; for 5 patients, because of weight loss, the performing of per-cutaneous endoscopic gastrostomy was recommended, but it was performed only in 2 cases; 3 of these 5 patients refused it. None of them did come back for continuing the treatment.

In course of radiotherapy dysphagia presented 80% of patients requiring non-steroids and steroids

anti-inflammatory medication alone or in combination with opioid use.

The weight loss occurs at 85.71% of total studied patients, recording a weight loss between 2 and 7 kg.

Skin reactions had been manifested as grade 1 and 2 acute radiodermatitis, on irradiated teguments, at the end of the treatment that did not required

From hematological point of view, we did not recorded anemia, leucopenia, and thrombocytopenia requiring the interruption of the treatment.

We assessed also the comorbid illnesses knowing their influence upon performance status of the patients. Our patient presented the following illnesses associated with tumor: myocardial infarct, stroke, high blood pressure, chronic ischemic heart disease, atrial fibrillation, decompensated diabetes mellitus, obliterant arteriopathy, senile cataract (table III-V, fig. 2).

Thus, 45 patients (58.4% of cases) presented two or more comorbid illnesses associated with the tumor, 10 patients (13%) presented only one comorbid illness and 22 patients (28.6%) had no one associated disease.

4. Discussions

Head and neck cancer's treatment for elderly patients is complex in the geriatric context because of the high toxicity of locally-regional treatment. External beam radiotherapy remains the standard treatment for elderly patients with locally advanced head and neck cancers.

Head and neck radiotherapy involves a great volume of irradiated oral mucous that leads to an increased toxicity, loss of appetite, damage of taste, weight loss, dysphagia, impairment of performance index.

Acute reactions from mucous level were of 1, 2 and 3 grade, conform WHO scale, and these reactions were controlled by anti-inflammatory medication and analgesics; in this lot we did not recorded major toxicity cases, respective grade 4 WHO and we did not recorded deaths during radiotherapy

Skin and hematological tolerance was satisfactory and permitted the performing of radiotherapy for studied patients, with purpose doses, for most of the cases.

In our study 80.5% ended their treatment at purpose total doses; 19.5% interrupt radiotherapy because of secondary toxicities and because of reduced compliance for treatment.

The main cause of radiotherapy interruption was grade 3 mucositis. The oral mucositis limits the patient's tolerance for radiotherapy and consequently the nutritional status [6].

The presence of comorbid illnesses (high blood pressure, painful ischemic heart disease, diabetes mellitus) did not represented a contraindication of radiotherapy for elderly patients, with head and neck locally-advanced cancers.

In the future we shall analyze also and split-course hypofractionation, which have multiple advantages in geriatric sphere. From radiobiological point of view, these fractionation regimes are not optimal, because of reducing of radiation dose intensity and promotes the tumor repopulation; on the other hand, the increase of dose/fraction leads to an increased toxicity.

Also it have to be evaluated the palliative treatment schemas for patients with locally-advanced disease, taking into consideration that there are many studies who evidence that in advanced incurable stages, the aggressive multimode curative treatments did not proved a clear benefit [7-10].

5. Conclusions

The age is not a contraindication for aggressive radiotherapy; the decision of radiotherapy treatment had to consider the performance status and also the severity of associated diseases. Over 2/3 of patients ended the radiotherapy with acceptable toxicities, at purposed total doses.

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