

KEYWORDS: acute respiratory distress of pharyngeal and laryngeal causes, vital risk, advanced management, tracheotomy, algorithms for the diagnosis and treatment.

A. CURRENT KNOWLEDGE

INTRODUCTION

Acute respiratory distress of pharyngeal and laryngeal causes or acute respiratory distress of a superior obstructive type is a first-class medical surgical emergency in the ENT pathology of both children and adults, a critical situation of vital risk, which requires a quick diagnose, a proper therapeutic conduct and perfect timing.

Clearing and protecting the airways is the first objective in managing any critical patient, thus initiating the stage of restoring the vital functions, and making this set of therapeutic gestures range under the letter A (airway) in the ABC of resuscitation, thus reinforcing the idea of their primordial nature as opposed to other therapeutic maneuvers.

CHAPTERS 1. – 6., cover the most important scientific information related to: the anatomy and physiology of the pharynx and of the larynx, the etiopathogeny of the acute respiratory distress of pharyngeal and laryngeal causes, the clinical and para clinical diagnose, the therapeutic conduct and health management.

B. OWN CONTRIBUTIONS

CHAPTER 7. PURPOSE AND OBJECTIVES. MATERIAL AND METHOD

The paper at hand aims at emphasizing the need for an advanced management of the acute respiratory distress of pharyngeal and laryngeal causes.

The study method used in this work was the clinical and statistical one, which consisted of estimating, comparing, correlating and making assumptions on the resulting data, in order to draw some general conclusions and prognosis which led me to design a diagnostic and therapeutic algorithm leading to a decrease in the number of hospitalization days, complications, morbidity and costs related to the patients who were admitted for ARD, as well as an increase in the case-mix number.

CHAPTER 8. RESULTS AND DISCUSSIONS

I performed a clinical, statistical, retrospective, analytical and descriptive study conducted over a period of five years (2008 – 2012), by comparing two groups (bi-centric study) :

- **the first group** I studied consisted of 483 patients suffering from an ARD of pharyngeal and laryngeal causes (8%), taken from the 5745 patients admitted in the ENT section of the County Emergency Hospital Vâlcea, endowed with 27 beds.

- **the second group** consisted of 527 patients with IRA an ARD of pharyngeal and laryngeal causes (5%), taken from the 10829 patients admitted in the ENT section of the County Emergency Hospital Craiova, endowed with 48 beds.

1. Comparative distribution of the ARD according to its pharyngeal or laryngeal cause within the two groups was:

- in the CEHV, during all the years of the study, it has been noticed an obvious predominance of the laryngeal cause of the ARD- 83.44% (82 cases), as opposed to the pharyngeal cause - 16.56% (401 cases);

- in the CEHC, during all the years of the study, it has been noticed an obvious predominance of the laryngeal cause of the ARD – 72.68% (383 cases), as opposed to the pharyngeal cause – 27.32% (144 cases).

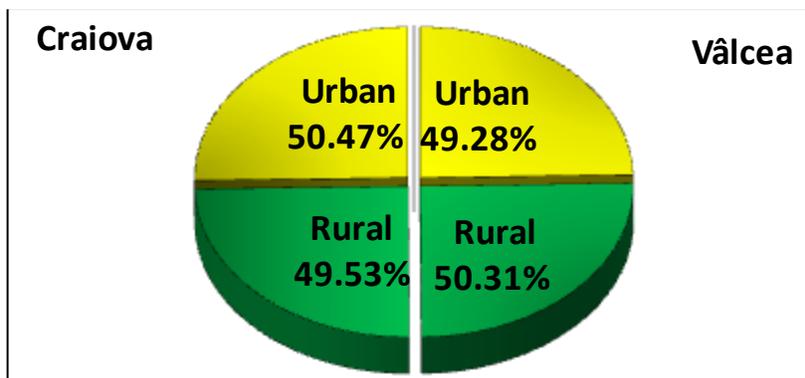
2. Comparative distribution according to the patients' sex

Within the two groups under study, the sex distribution of the cases showed that there is an obvious predominance of the male sex in both groups, significantly larger in the second group in the CEHC (81% as opposed to 59%). It is worth noting that the sex distribution in both groups was significantly different from the general sex distribution of the population (51.4% women, 48.6% men) and the input of p in the Z quote test was $\sim 0 < 0.001$.

3. Comparative distribution according to the patients' origin

It was noticed that there are no significant differences between the number of patients originating in the rural and in the urban area, and this distribution was in accordance with the general distribution of the population.

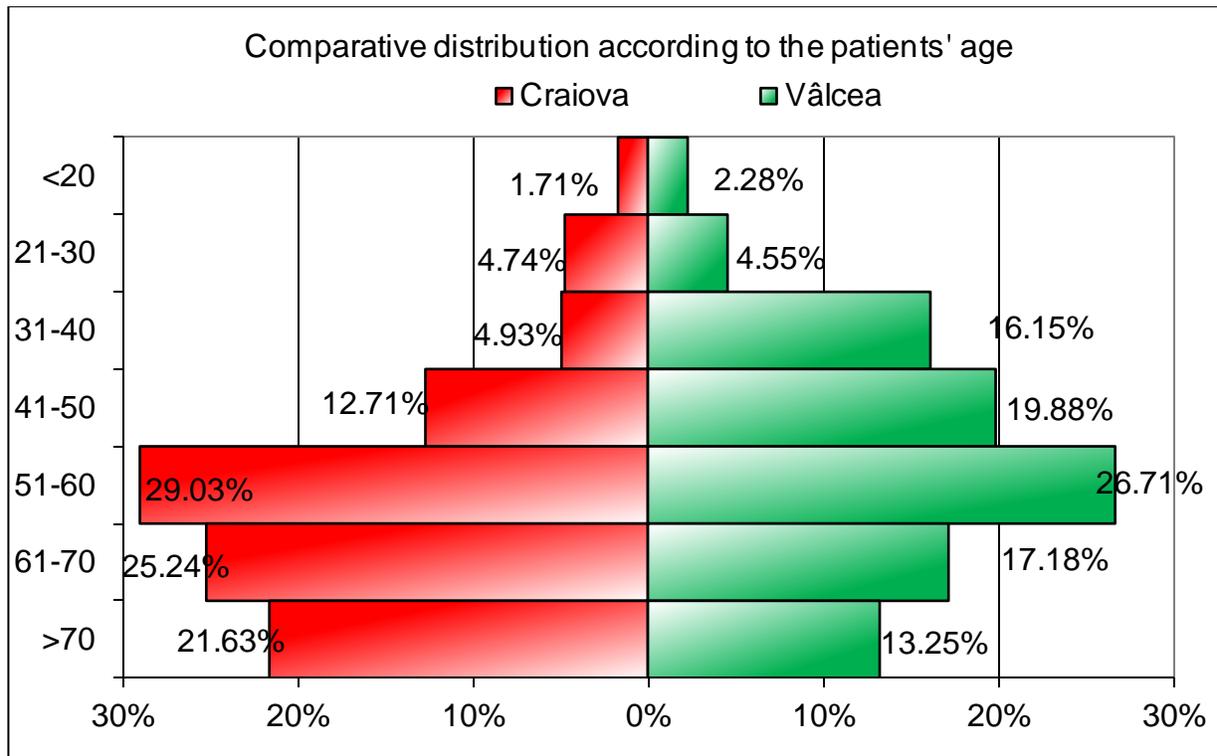
Chart 1. Distribution of cases according to the patients' origin



4. Comparative distribution according to the patients' age group

The predominant age group in both groups was the 51 - 60 years old one (27%, respectively 29 %). There are differences between the age groups over 50 years old, which stand for 75% of the patients with ARD admitted in the ENT section in Craiova, a group more than the similar cases in Vâlcea (57%)

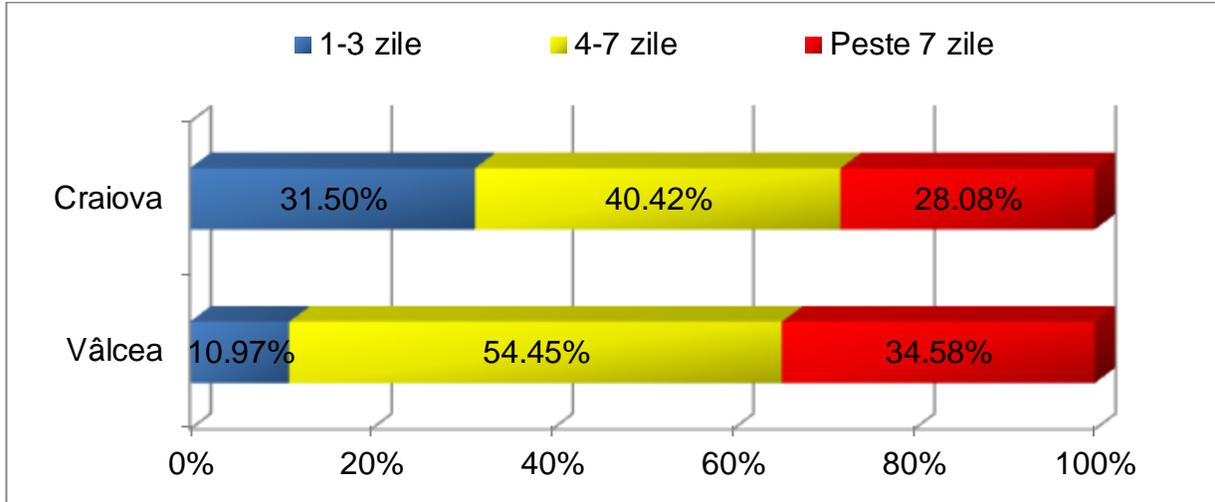
Chart 2. Distribution of cases according to the patients' age



5. Comparative distribution according to the number of hospitalization days

In both groups under study, most patients were admitted between 4 and 7 days. The percentage of cases solved in 1-3 days, 11% in the CEHV as opposed to the 32% in the CEHC proves the expected higher efficiency of the clinic in Craiova. A much better correlation can be made by overlapping the two groups according to their etiology, because the number of hospitalization days is strictly connected to the etiology of the ARD.

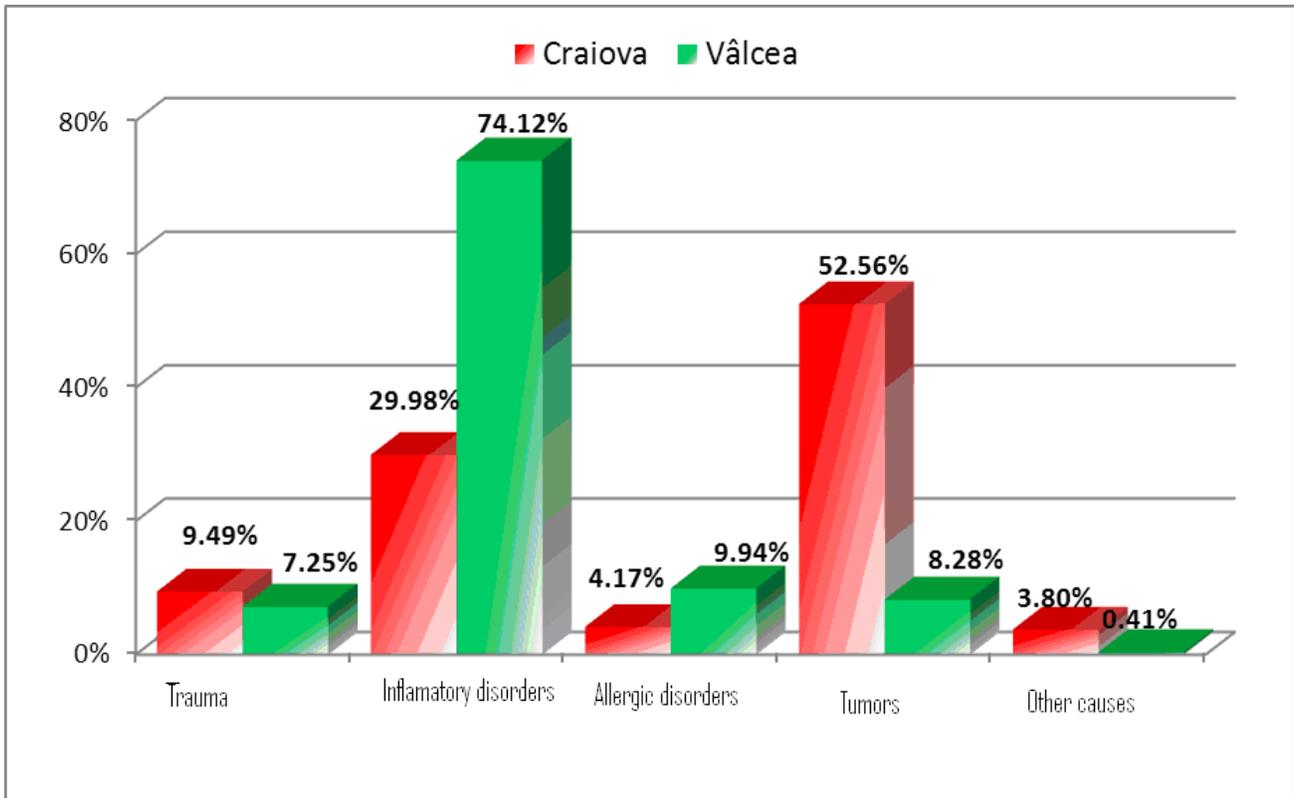
Chart 3. Distribution of cases according to the number of hospitalization days



6. Comparative distribution of cases according to their etiology

After having analyzed the etiology of the ARD, I noticed a significant difference between the two groups under study (p Chi square = $1.86 \times 10^{-59} \sim 0 < 0.001$). the most significant differences could be noticed in the case of ARDs of inflammatory causes, the majority of them occurring in the group in the CEHV (almost 75%), respectively ARD caused by tumors, which were over 50% of the cases in the ENT Clinic in Craiova.

Chart 4. Comparative distribution of cases according to their etiology



The endoscopic images below, taken from the database of the ENT section and of the ENT clinic are instances of the aspect of the endolarynx according to its etiology.



Figure 1. Allergic laryngeal edema



Figure 2. Abscess of epiglottic valleculae



Figure 2. Nonkeratinized papillomatosis in an adult

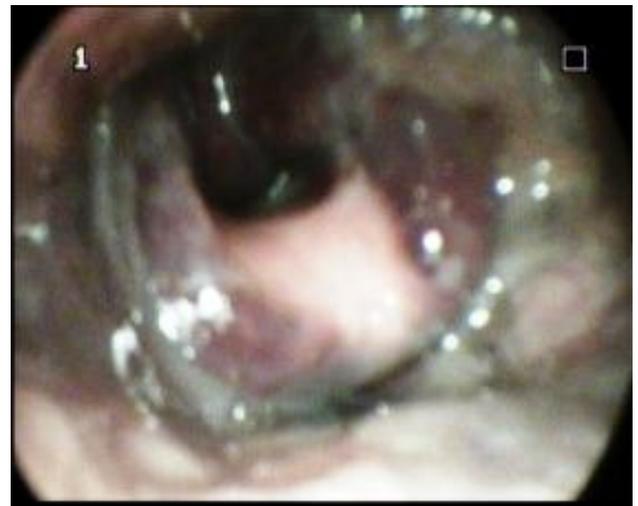
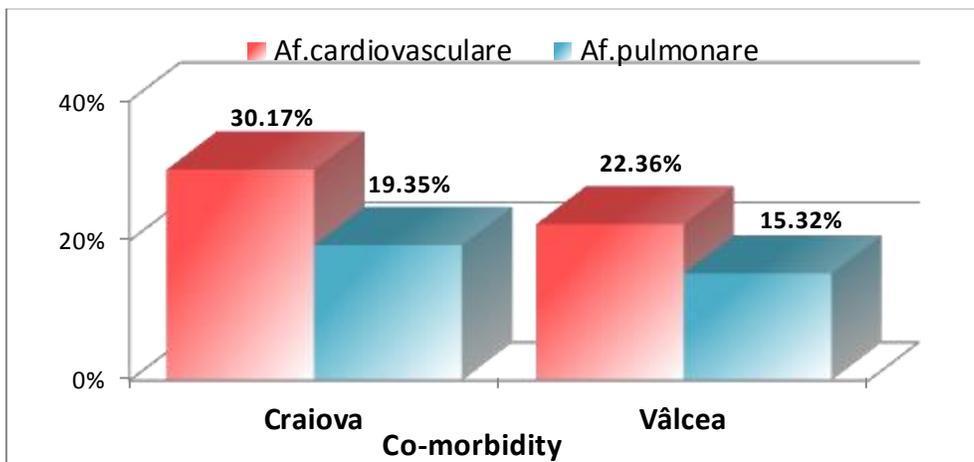


Figure 3. Endolaryngeal trauma

7. Co-morbidity in the two groups

After having compared the co-morbidity in the two groups under study I noticed the predominance of cardiac and vascular diseases as opposed to the pulmonary ones.

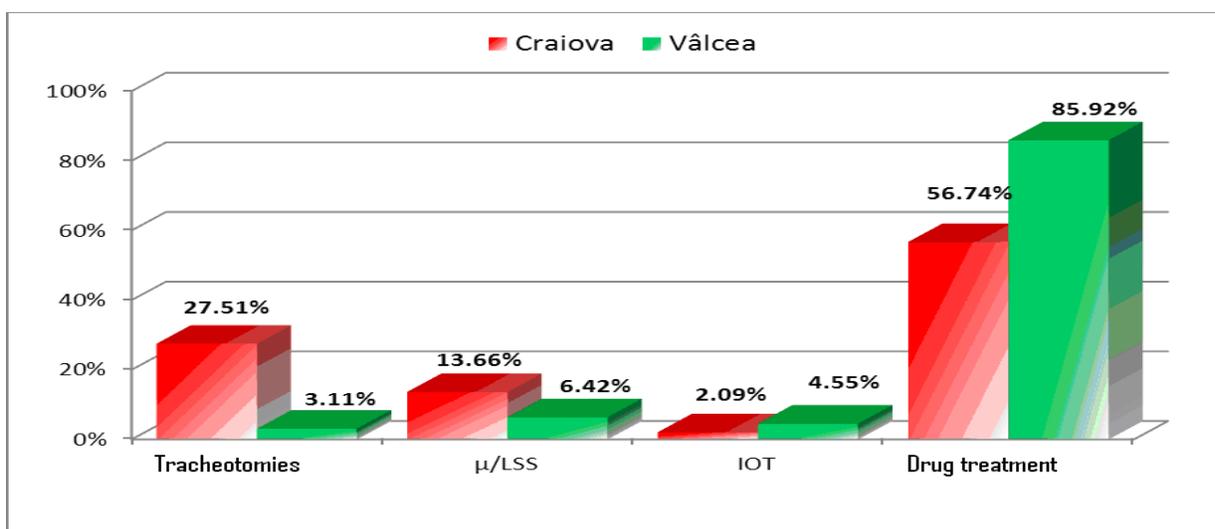
Chart 5. Co-morbidity in the two groups



8. Comparative distribution of cases according to the treatment

After having analyzed the treatment used in the two clinics, it was noticed and emphasized a significant statistical difference, the input of p in Chi square was of $2.157 \times 10^{-30} \sim 0 < 0.001$. Whereas in the ENT section in Râmnicu-Vâlcea there is a high percentage of medication being used as the main treatment (over 85% of the cases), in the ENT Clinic in Craiova, there is a more frequent use of surgical procedures (tracheotomy – 27.5%, as opposed to 3.1%, and suspension laryngoscopy with lesion extraction – 13.66% as opposed to 6.42%).

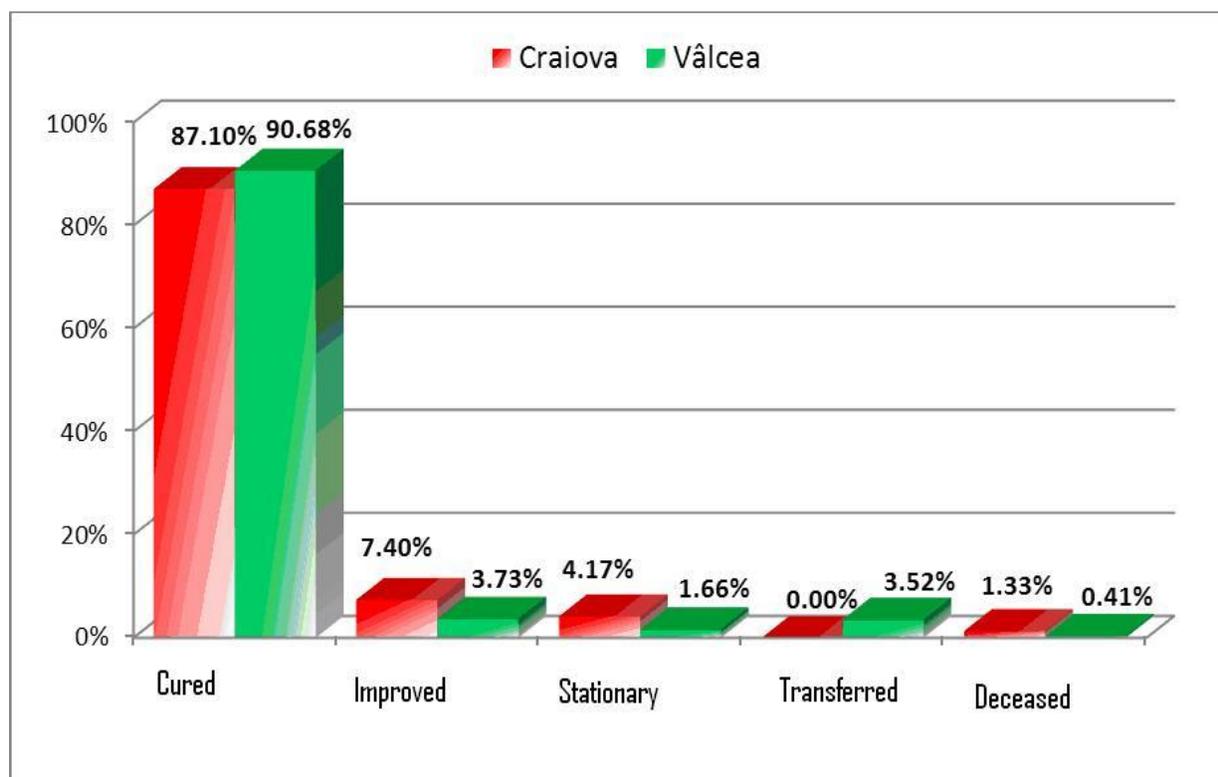
Chart 6. Comparative distribution of cases according to the treatment



9. Comparative distribution according to the patients' condition upon discharge

In both groups there is a high percentage of patients, over 87%, who were healed upon discharge, but, statistically, there is a highly significant difference between the results upon discharge, as the input of p in the Chi square test was $1.386 \times 10^{-6} < 0,001$. The differences are apparently small, less than 4%, but they are statistically significant, as the total number of patients is of approximately 500 for each group, which can be accounted for by the fact that the patients in the ENT Clinic in Craiova mostly come from the other medical centers in the Oltenia region. Since these are usually the most difficult cases, it is normal that their prognosis and condition upon discharge be less favorable.

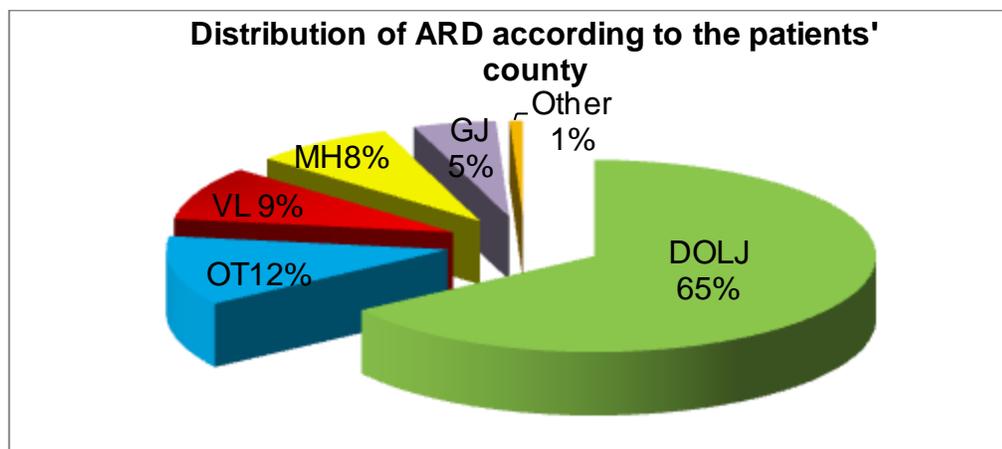
Chart 7. Comparative distribution of cases according to the patients' condition upon discharge



10. Distribution of ARD cases according to the patients' county of origin

Another aspect which is worth noting is the fact that many patients referred to the clinic for treatment for ARD come from the surrounding counties. It is noticed that most patients were referred from the counties of Olt, 12%, Vâlcea, 9%, Mehedinți, 8% and Gorj, 5%.

Chart 8. Distribution of ARD cases according to the patients' county of origin



Algorithms for the diagnosis and treatment of the ARD of pharyngeal and laryngeal causes

I. General rules

1. A strategic plan for this kind of situations.
2. Highly trained medical staff, familiar with the management of the airways.
3. The necessary medical equipment, available in due time.
4. Written cooperation protocols for critical situations (EAU, ENT, AIC, Pediatrics)
5. Each doctor involved in this activity ought to have: the ability to anticipate and solve the various situations that might occur, critical thinking, flexibility, adaptability, stress tolerance, model image, communication and organization skills (excellent prioritizing skills).

II. Objectives

1. Identifying the cause of dyspnea: respiratory, circulatory, nervous

The pharyngeal and laryngeal dyspnea belongs to respiratory dyspneas of the superior obstructive type, and it is one of the main signs of the condition of these organs having worsened. It has different manifestations, depending on its location: supra glotal – dyspnea with odynophagia and sialorrhoea or ggroupital – dyspnea with dysphonia.

2. **Assessing the seriousness of the dyspnea according to:** the patient's age, given the fact that new-born babies and young children have specific characteristics which make them more vulnerable; the degree of obstruction: complete, partial or potential,

judging by a series of minor and major signs;the way in which it started: suddenly or slowly ;the analysis of the pharyngeal and laryngeal lesions.

3. Identifying the etiology of the dyspnea, when it is possible to do so, by means of: anamnesis, local and general clinical examinations, nasal, pharyngeal and laryngeal fibro-endoscopy, which is a modern assessment method, radiological exploration, maybe a cervical and thoracic CT scan in the case of traumas and tumors.

4. Therapeutic conduct:

A. If the patient is conscious:

Basic measures and techniques to be applied on all patients suffering from ARD of laryngeal and pharyngeal causes

1. Hospitalization, wet and warm atmosphere
2. Calming the patient and vocal rest
3. Monitoring vital function, including pulsoxymetry
4. Venous line for access and collection of biological samples, including partial O₂ and CO₂ pressure in the arterial blood.
5. Controlled oxygen therapy
6. Suction of secretions, blood or foreign bodies from the oral cavity or from the pharynx, if need be
7. Corticotherapy
8. Cough stopping, pain killers and anti-thermal medication, local disinfectants

Further measures and techniques, depending on the etiology and seriousness of the dyspnea:

- extracting the foreign bodies in the pharynx and in the larynx;
- performing OTI/ NTI or TRACHEOTOMY, should the respiratory obstruction persist
- wide-range antibiotics
- taking specific measures, depending on the etiology: traumatic, inflammatory or tumorous.

B. If the patient is unconscious

In the EAU: **Level I – RESUSCITATION** (code red) life-saving intervention

Basic means and techniques used for opening the airways

1. The Saffar triple maneuver
2. The airways adjuncts

Advanced methods:

1. The laryngeal mask and the combitube (esophageal obstructor with an airway)
2. OTI or NTI
3. The surgical airway: the needle cricothyroidotomy, the surgical cricothyroidotomy, the tracheotomy.

Emergency CPAP (continuous positive airway pressure) ventilation

Emergency BiPAP (bi-level positive airway pressure) ventilation.

CHAPTER 9. CONCLUSIONS:

1. The acute respiratory distress is the inability of the respiratory system to perform an efficient gas exchange, leading to a decrease in the level of blood oxygen (hypoxemia) and to an increase in the level of carbon dioxide (hypercapnia).
2. The acute respiratory deficiency of pharyngeal and laryngeal causes or the acute respiratory distress of the superior obstructive type is a first-class medical and surgical emergency in the ENT pathology both in babies as well as in adults
3. Being a critical situation of a vital risk, it requires: a timely identification of the cause, applying an emergency therapy in order to permeate the airway and restore pulmonary ventilation, a well-trained, experienced and equipped medical team, in order to attain therapeutic success to the maximum benefit of the patient.
4. Assessing the gravity of the dyspnea can be done according to the clinical signs below: major signs, which are always present (respiratory bradypnea, suprasternal and supraclavicular retraction, lowered larynx upon inspiration) and minor signs, which may not always be present (expanded head with the patient on the side of the bed leaning on their

arms, strider, dysphonia, coughing, dysphagia, venous stasis in the cervical and facial area, paradoxical pulse, etc.)

5. Based on these premises and following a thorough documentation, and compared to the latest reports in the specialized literature, I performed a clinical, statistical, retrospective, analytical and descriptive study over a period of 5 years (2008 – 2012), based on the comparison of two groups.

6. After having analyzed the etiology of the ARD, I noticed a highly significant difference between the two groups under study (the input of p in the Chi square test was $1.86 \times 10^{-59} \sim 0 < 0.001$). The most significant differences were related to the ARD of inflammatory causes, which were predominant among the patients in the group in the ENT section in Râmnicu-Vâlcea (almost 75%), respectively the ARD caused by tumors, accounting for 50% of the causes of ARD found in the ENT clinic in Craiova. The ARD of laryngeal causes was dominated by the neoplastic pathology, 44.13%, the inflammatory one, 32.64%, the traumatic one, 9.40% and the neurological one (the Gerhardt diplegia), 7%. The pharyngeal cause of the ARD in the ENT clinic in Craiova was also represented by tumors, 65.28%. The first type of tumors which occurred here were the tongue tumors, followed by the hypo-pharyngeal ones.

7. A positive diagnosis was set in the emergency unit, after having performed a general and local objective examination of the pharyngeal and laryngeal area, along with other para clinical examinations.

8. The emergency therapeutic conduct consisted of a differentiated treatment depending on the respective condition; medication was administered in inflammations, whereas surgical tracheotomy was performed in cases of tumors.

9. A thorough knowledge of the members of the medical team of each stage of the treatment, of the necessary equipment, of the maneuvers which are necessary depending on the characteristics of the case may lead to a more efficient medical act, reduced costs and saved lives.

10. Based on the general management principles and functions, on the theoretical medical knowledge, on the clinical and statistical study of the patients suffering from ARD of pharyngeal and laryngeal causes, designing a diagnosis and treatment algorithm for an acute condition of a vital risk is welcomed and extremely necessary for each doctor, nurse or patient.

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