CLINICAL-EPIDEMIOLOGICAL STUDY ON ADVANCED NON-SMALL CELL LUNG CANCER

L. Miron¹, M. Bosanceanu², Raluca Filimon³, F.D. Petrariu⁴
Regional Institute of Oncology - Iasi
1. Clinic of Oncologic Internal Medicine
2. Clinic of IInd Oncologic Surgery
3. Department for nosocomial infections prevention and control
University of Medicine and Pharmacy “Grigore T. Popa”-Iasi
Faculty of Medicine
4. Discipline of Hygiene-Environmental Health

CLINICAL-EPIDEMIOLOGICAL STUDY ON ADVANCED NON-SMALL CELL LUNG CANCER (Abstract). **Aim:** To assess the clinical and epidemiological features of all three main histological types of non-small cell lung cancer (NSCLC). **Materials and methods:** The study included 34 patients with NSCLC admitted to specialized units of the Iasi Regional Cancer Institute (IRCI) in the interval May 2012 - May 2014. Data were collected electronically based on a clinical-epidemiological survey form. The obtained data were then processed and interpreted by statistical-mathematical methods using the correlation index (significant at \( p \leq 0.05 \) and highly significant at \( p < 0.005 \)), chi-square and Y tests. Data were analyzed using SPSS 13.0 (SPSS Inc. Chicago, Illinois, USA). **Results:** Most NSCLC patients were aged 56-71 years, the Pearson correlation index between age and diagnosis being \( p = 0.01 \). Sex difference was highly significant \( (p< 0.001) \) and so was the relationship between heavy smoking and age groups. Most cases were histogenetically classified as adenocarcinomas \( (22\%) \). Four patients \( (21\%) \) were in stage IIIA NSCLC, 4 \( (21\%) \) IIIB, 9 \( (47.3\%) \) IV, and 15 \( (79\%) \) unspecified stage. All patients received primary chemotherapy. Single or associated complications included anemia and other hematologic disorders \( (26\%-74.6\%) \), respiratory failure, hemoptysis, cachexia, atelectasis, etc. Surgery was performed in 5 \( (14.7\%) \) stage IIIA NSCLC patients. **Conclusions:** NSCLC showed a highly significant predominance in the age groups 56-71 years, and the most common histologic type was adenocarcinoma. All patients received primary chemotherapy, and patients with stage IIIA underwent surgery. Anemia and other hematologic disorders were the most common complications. **Keywords:** CLINICAL-EPIDEMIOLOGICAL, CANCER, NON-SMALL CELL LUNG CANCER.

By its high incidence and mortality lung cancer is one of the most common human malignancies. Thus, in the European Union the incidence of lung cancer exceeds annually 50/100,000 people, 82.5 in men and 23.9 in women.

In Romania, lung cancer has a mortality rate of about 60/100,000 people in men and 14/100,000 in women \((1, 2)\). Of all lung cancers, 80-85% are non-small cell lung cancer (NSCLC), with the three major histological subtypes (squamocellular – 50%, adenocarcinoma – 15%, anaplastic – 15%), but with similar biological, clinical
and therapeutic features.

Clinical manifestations range widely from a small number of asymptomatic cases to cases presenting local tumor growth, regional spread, metastatic dissemination, and presence of paraneoplastic syndromes (3, 4, 5).

This study aimed to assess the clinical and epidemiological features of a series of patients with NSCLC admitted to specialized units of the Iasi Regional Cancer Institute (IRCI) (6, 7).

**MATERIAL AND METHODS**

This clinical-epidemiological study included a series of 34 patients with NSCLC admitted to IRCI in the interval May 2012 - May 2014. The patients were aged 52-81 years, 26 (76.4%) of them belonging to age group 56-75 years; 32 (94.1%) were men and 2 (5.9%) were women; over 80% resided in urban areas.

Data were collected electronically based on a clinical-epidemiological survey form, and were then processed and interpreted using statistical-mathematical methods: Pearson correlation index, significance (p = 0.05) and highly significant (p <0.005), and chi-square, Y tests, CI = 95% tests; data were analyzed using SPSS 13.0 software.

**RESULTS AND DISCUSSION**

Age-group distribution showed that the majority of NSCLC patients were aged 56-71 years (26-76.4%), the study patients covering all 7 age groups (fig. 1).

![Age-group distribution of the study patients](image)

Pearson correlation index between age and diagnosis was p=0.01, which is consistent with our epidemiological data showing that 26 (76.4%) of our cases belonged to age group 56-75 years, and in agreement with data in other studies (32 - 94.1% vs. 2 - 5.9%) (p <0.001).

Twenty-nine patients (85.3%) of the 34 study patients had a history of heavy smoking for at least 2-3 decades; all these patients were men, distributed quite evenly over all age groups, and with a very strong statistically significant correlation (p<0.0001). Our data are consistent with those reported by many epidemiological studies (8, 9).

Adenocarcinoma was the most common type according to histogenetic classification (22 - 64.7%), followed by squamous cell carcinoma (8 - 23.5%) and large cell carcinoma (4 - 11.8%) (tab. I).

Histologic grading (WHO) was carried out in 7 (20.6%) cases (G2: 2-28% and G3: 5 - 71.4%).
TABLE I
Percentage validation of the cases based on histogenetic classification

<table>
<thead>
<tr>
<th>Valid</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenocarcinoma</td>
<td>20</td>
<td>58.8</td>
<td>58.8</td>
<td>58.8</td>
</tr>
<tr>
<td>Squamous carcinoma</td>
<td>7</td>
<td>20.6</td>
<td>20.6</td>
<td>79.4</td>
</tr>
<tr>
<td>Others</td>
<td>7</td>
<td>20.6</td>
<td>20.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>100.0</td>
<td>100.0</td>
<td>-</td>
</tr>
</tbody>
</table>

Staging at the time of diagnosis was carried out in 19 (55.9%) of the 34 patients enrolled in the study: 4 (21%) patients were in stage IIIA, 6 (31.6%) in stage IIIB, 9 (47.3%) in stage IV and 4 (21%) unspecified stage (tab. II).

TABLE II
Percentage validation of the cases based on disease staging

<table>
<thead>
<tr>
<th>Valid</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIIA</td>
<td>4</td>
<td>11.8</td>
<td>11.8</td>
<td>11.8</td>
</tr>
<tr>
<td>IIIB</td>
<td>6</td>
<td>17.6</td>
<td>17.6</td>
<td>29.4</td>
</tr>
<tr>
<td>IV</td>
<td>9</td>
<td>26.5</td>
<td>26.5</td>
<td>55.9</td>
</tr>
<tr>
<td>Unspecified</td>
<td>15</td>
<td>44.1</td>
<td>44.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>100.0</td>
<td>100.0</td>
<td>-</td>
</tr>
</tbody>
</table>

Histological classification and staging together with the objective and subjective clinical findings guided the therapeutic approach.

All 34 patients included in the study and follow received primary chemotherapy with cytostatic agents active against NSCLC according to the guidelines of the sixth edition of AJCC Cancer Staging Manual, New York, Springer, 2000 (11, 12, 13, 14).

Various complications were recorded in 26 (76.4%) of the 34 study patients (15, 16, 17, 18) (tab. III, IV).

TABLE III
Complications recorded in the 34 patients with NSCLC (single or associated)

<table>
<thead>
<tr>
<th>Category</th>
<th>No. of cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anemia</td>
<td>14</td>
<td>41.7</td>
</tr>
<tr>
<td>Other hematologic disorders</td>
<td>12</td>
<td>35.3</td>
</tr>
<tr>
<td>Respiratory failure</td>
<td>8</td>
<td>23.5</td>
</tr>
<tr>
<td>Hemoptysis</td>
<td>4</td>
<td>11.8</td>
</tr>
<tr>
<td>Cachexia</td>
<td>4</td>
<td>11.8</td>
</tr>
<tr>
<td>Other complications (lung abscess, atelectasis, lymphangitis, perithoracic phlegmons)</td>
<td>1 case each</td>
<td></td>
</tr>
</tbody>
</table>
Clinical-epidemiological study on advanced non-small cell lung cancer

**TABLE IV**
Percentage frequency of complications

<table>
<thead>
<tr>
<th></th>
<th>Valid</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>26</td>
<td>76.5</td>
<td>76.5</td>
<td>76.5</td>
<td>76.5</td>
</tr>
<tr>
<td>No</td>
<td>8</td>
<td>23.5</td>
<td>23.5</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Surgery was performed in 5 (14.7%) patients with stage IIIA resectable NSCLC as it is recognized to have superior therapeutic benefits (19, 20).

**CONCLUSIONS**

Lung cancer represents the most important neoplasia, in Romania. The increased incidence of adenocarcinoma histologic subtype is highlighted in our study, too. Advanced stages are predominantly associated with co-morbidities due to the evolution of neoplasia, but certain complications.

**REFERENCES**

The objective of this review was to summarize literature describing approaches aimed at automatically identifying patients with a common phenotype. The authors performed a review of studies describing systems or reporting techniques developed for identifying cohorts of patients with specific phenotypes. Every full text article published in (1) *Journal of American Medical Informatics Association*, (2) *Journal of Biomedical Informatics*, (3) *Proceedings of the Annual American Medical Informatics Association Symposium*, and (4) *Proceedings of Clinical Research Informatics Conference* within the past 3 years was assessed for inclusion in the review. Only articles using automated techniques were included. The identification of patients who satisfy predefined criteria from a large population in an institution has numerous use cases, including clinical trial recruitment, outcome prediction, survival analysis, and other kinds of retrospective studies. However, the process of distinguishing these patients on the basis of their patient records can be extremely time-consuming and challenging depending on the complexity of the criteria. This is because the data matching these criteria are buried within multiple documents and across multiple data points in the electronic health record (EHR) of a patient. Some data, such as laboratory results, medications, and diagnoses, have a structured format. The ability to extract meaningful pieces of information from the EHR and consolidate them into a coherent structure would provide great value for automatically identifying patient cohorts that satisfy complex criteria. Studies in this review addressed different diagnoses as the phenotype of interest. A large number of papers focused on diabetes, cancer, heart failure, rheumatoid arthritis, or cataract. A few studies described generic methods that could be applied to multiple diagnoses. Several papers addressed identification of adverse drug events. Some studies also analyzed genomic data of a predetermined phenotype to gain insight into other phenotypic properties of the same cohort. Authors have developed a top of the first 10 phenotypes of interest. Although cancer has been reported as a generic phenotype, there were 12 types of cancer (with breast cancer being most prevalent) studied in seven articles. Congestive heart failure and heart failure were counted as the same phenotype. Similarly, hypertension and resistant hypertension were considered to be one phenotype. Some articles also considered other observable characteristics such as smoking status and obesity among patients. Pneumonia and a variety of other infectious diseases were studied. This review is not without limitations, especially for the vagueness of the term phenotyping, meaning that there is no exhaustive search strategy for retrieving appropriate articles across the entire available body of biomedical literature. However, because of the venues considered and the recent popularity of this topic, this review is representative of past and present efforts in this domain. (Shivade C, Raghavan P, Fosler-Lussier E, Embi PJ, Elhadad N, Johnson SB, Lai AM. A review of approaches to identifying patient phenotype cohorts using electronic health records *J Am Med Inform Assoc* 2014;21:221-230 doi:10.1136/amiajnl-2013-001935).