

## ACUTE PNEUMOPATHIES IN THE ELDERLY

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**Summary.** The study was conducted on 226 patients aged 61 to 96, suffering from acute pneumopathies; 23.4% presented normal and 76.6% accelerated aging; 2 to 4 morbid associations were noticed in the last group, with the prevalence of chronic bronchopulmonary and cardio-vascular diseases, diabetes, alcoholism, etc.

The characteristics of the clinical symptoms were cough with muco-purulent expectoration, moderate or absent fever, thoracic pains, leukocytosis. Functionally, 35% of the patients presented severe respiratory or cardiovascular failure.

Bacteriologically, a variable uncharacteristic flora was prevalent in most cases, this pointing out the virus-bacterial mixed etiology.

The X ray pointed out that disseminated bronchopneumonias were the most frequent forms; the percentage of lobar pneumonia was lower.

A discrepancy was noticed between the dominant and persistent radiologic pattern and the clinical one.

The severe forms represented 38.1%, in 43% of the cases the evolution was slow and recurrent, pleuro-pulmonary, cardio-vascular, renal complications occurred in 59.8%, mortality reached 17% and was prevalent with the polymorbid group.

The anatomopathological examination pointed out giant cells without hepatization as a peculiarity in the pneumonic deceased patients.

The therapy administered was complex and included antibiotics, mucolytics, fluidifiants, cardiotonic agents, bronchodilators, analeptics, as well as diets with hydroelectrolytic additives and vitamins to control the deficits in the aged.

The favourable clinical evolution and the lower mortality rate in Gerovital H<sub>3</sub> treated cases were pointed out.

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The analysis of the last 10 years mortality at the National Institute of Gerontology and Geriatrics revealed that acute pneumopathy was the major cause in 35% of the deaths (fig. 1).

The statistics on morbidity caused by acute diseases point out the significantly higher incidence of respiratory infections in the elderly than in adults [1, 4, 5, 6, 7, 8, 13, 17, 19, 20, 21].

The general opinion on acute pneumopathy, classified into bacterial and viral, has received a new interpretation because of the higher incidence of virus pneumonia (nearly 40%; as against 20% bacterial and 39-40% atypical mixed forms) with virus and bacterial flora and microplasm prevalence [4, 5, 6, 16, 17, 19, 20, 21].

Along epidemiological observations the modification of the clinical aspect has been noticed, particularly after the extensive use of the antibiotics with wide spectrum. Thus, the place of lobar pneumonia has been taken by the interstitial atypical pneumonia and most of the bacterial pneumonia has been noticed to follow after virus pneumonia as a result of bacteria-virus synergism [4, 5, 6, 16, 17, 19].

As shown before, the acute virus-bacterial pneumonia is more severe and lingering in the elderly, because of the factors closely correlated with advanced age, such as: the drop in functional respiratory reserves and adaptative abilities, de-

crease or lack of reactivity to infections, the diminished drug tolerance, nutritional deficiencies [2, 3, 10, 11, 14, 21, 29, 30].

The pneumopathy is particularly severe when occurring in already deficient organisms suffering from different diseases such as: chronic bronchopulmonary, cardiovascular afflictions, diabetes, ethylism, etc. [12, 13, 15, 19, 20, 24, 27].

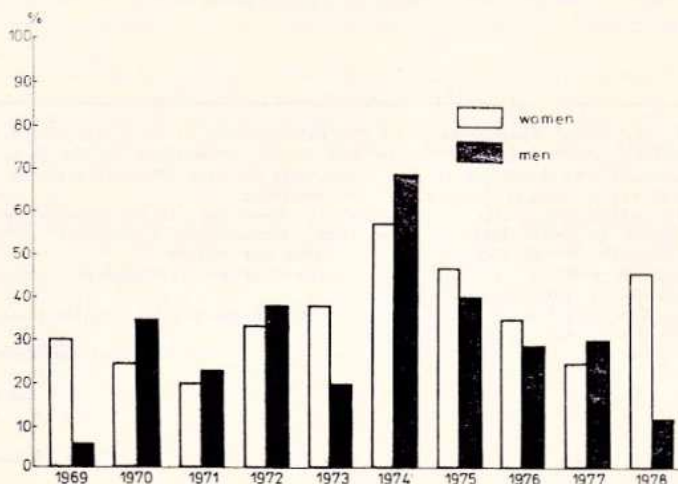


Fig. 1. — The dynamics of mortality due to acute pneumopathies (pneumonias and bronchopneumonias) by sex during the last 10 years as compared to the general mortality figures in NIGG.

From the anatomic, physiologic and immunologic aspects the local defense mechanisms involve three progressive echelons, each reacting after the aggressive factors had passed the previous one. The first is the bronchial and bronchoalveolar barrier which triggers the defense reaction of the surfactant mucus: the continuous pulmonary clearance. After the aggressive factors have passed this echelon, the lympho-reticular system starts to react setting in function the cellular and humoral immunity mechanisms, that is the leucocytes, lymphocytes, monocytes and immunoglobulins. The third echelon is the mesenchymal mechanism the reaction of which is the exudative inflammation. Under normal conditions, the clearance of the respiratory pathways is quite efficient and they are kept sterile. But if the defense mechanisms are impaired, the external aggressive factors strong and the defense ability abated, a vicious circle is created due to the onset of the pneumopathy in which the "opportunistic" germs from the oropharynx are the aggressive factors [18, 19, 29]. The studies on the morpho-functional characteristics of the respiratory apparatus in the elderly, conducted at the National Institute of Gerontology and Geriatrics pointed out macro and microscopic structural changes in the alveolar wall (consisting in the thinning of the wall), bronchial mucus and local metabolic modifications [19, 22, 28]. The changes in the lung physiology with the third age and the involution of the immunologic systems favour the onset of acute diseases.

## MATERIAL AND METHOD

The study was conducted on 226 patients with acute pneumopathy aged 61 to 96, hospitalized at the National Institute of Gerontology and Geriatrics over the last 10 years.

## RESULTS AND DISCUSSION

From the gerontological standpoint, the aging was normal in only 55 subjects (23.4%); the rest presented accelerated aging and morbid associations, prior to the onset of acute pneumopathy. The morbid associations were the following:

Table 1

Associated diseases	No. of cases
Chronic bronchitis and/or bronchiectasis	61
Pulmonary sclero-emphysema	59
Myocardial and vascular diseases	57
Diabetes mellitus	15
Alcoholism	10
Renal sclerosis	9
Gastro-duodenal ulcer	6
Rheumatoid polyarthritis	4
Other diseases	4

The table shows that the onset of the acute pneumopathy was subsequent to a previous chronic pulmonary disease in 61% of the cases. The impairment of the bronchial stem and the deficient reliability of the pulmonary parenchyma, the defense mechanisms of which are more easily defeated because of the respiratory infection, account for the above-mentioned fact.

The second important group includes the cardiovascular diseases, diabetes mellitus and alcoholism, as deficiencies in which the natural defense mechanisms are weakened by the disease itself, dietary restrictions and metabolic disturbances thus favouring the onset of acute respiratory infections. The last part of the table mentions the less frequent associated diseases which favour the onset of respiratory diseases such as neuronal or immunologic deficiencies, etc.

Mention should be made that 2 to 4 of the diseases presented in the table were associated in 43% of the cases. The clinical symptoms were: cough, with quantitatively variable muco-purulent expectoration; fever, moderate or even absent (as a result of the poor reactivity in the elderly); thoracic pains; increased leucocytosis following closely the progress of the bronchial infection.

Our cases confirm the polymorphous aspect of the infection which is in most cases viral and bacterial, because as known, leucopenia was shown to prevail with the simple virus infections.

Functionally, 79 patients studied (35%) presented severe respiratory failure, due to the progress of suppurative bronchitis in 47% and myocardial decompen-

sation in 32% of the cases; thus, the functional pattern was that of cardio-respiratory failure.

Bacteriologically, an uncharacteristic variable flora was revealed (pneumococcus, staphylococcus, enterobacteriae).

The progress of pneumonia was quite severe in the 13 cases with *Clebsiella Friedländer*.

The patients with *Friedländer* infections were prone to necrosis with micro-abscess. In staphylococcal infections the giant bullae described were not noticed probably because of the fibrosis of the parenchyma displayed by the elderly, in whom the pulmonary valve phenomenon can not be achieved.

The X-ray examination revealed most frequently disseminated broncho-pneumonia (85.6%); lobar pneumonia was present in only 14.4% of the cases — some peculiar forms of bronchopneumonias should be mentioned:

1. The uni- or bilateral disseminated lobar forms with foci ununiformly dispersed through the lungs.

2. Symmetric node disseminated forms with atelectasic nodes subsequent to severe chronic bronchial afflictions.

3. Disseminated forms with "too nice" pulmonary image revealing the quite severe acute or subacute bronchiolitis.

4. Systemic reticulo-nodal forms with monomorphous or polymorphous elements and progressive interstitial fibrosis.

5. Macronodular forms:

— confluent or partially confluent

— pseudolobar, quite severe.

Most of the cases presented peribronchovascular reaction or infiltration with increased hypertransparence due to the already existing emphysema. In the patients with virus pneumonia (14.4%) the condensation was subsegmentary, segmentary and quite seldom lobar. Mention should be made of the pseudotumoral forms, in which the pneumonic process occurring in the ventral, parahillar and paradiastinal segments raises problems for the differential diagnosis with a bronchopulmonary tumor with superadded infection [9, 23, 24].

A discordance between the clinical and radiologic patterns was frequently noticed; the radiologic pattern appeared more complex, dominant and persistent than the clinical one blurred out by therapy, particularly antibiotic.

The macroscopic anatomo-pathological investigation of the pneumonic patients revealed lungs with soft consistency, which on the microscope displayed accumulations of giant cells or pneumonia without hepatization. The more abundant lympho-poly-morphonuclear infiltration is a basic peculiarity with the aged, as against the lack of fibrin production. Areas with tissular necrosis were noticed at the level of the pneumonic or broncho-pneumonic foci. Numerous epithelial metaplasias and abundant muco-purulent exudate were noticed in the bronchia, associated with the desquamation of the epithelial cells and lymphopolynuclear detritus.

A positive diagnosis was difficult, particularly in the preexisting pulmonary afflictions, because of either an exacerbation of the chronic disease or an acute superadded process. The diagnosis was based mainly on laboratory findings and radiologic examinations.

In 44 cases (19.5%) the remission was normal with *restitutio ad integrum*.

In 109 cases (43.7%) the remission was slow, lingering from one to 4 months, recurrences occurring.

In 36 cases (16%) the disease, particularly when bronchial, became chronic. Among Friedländer patients, mortality reached 30%. The total mortality figure was 21%.

The complications which occurred were:

- a — pulmonary:
  - suppuration (11 cases, 4.9%)
  - abscess
- b — pleural:
  - para- or metapneumonic pleural reactions (28 cases, 12.4%)
  - encysted pleurisy (21 cases, 9.8%)
- c — bronchial (19 cases, 8.3%)
- d — cardiovascular (34 cases, 15%) among which:
  - acute myocardial decompensation (32 cases, 15%)
  - thromboembolism (2 cases)
- e — renal (7 cases, 31%)
  - acute renal failure.

Complications occurred in 59.6% of the cases.

The associated diseases were noticed to worsen the condition of elderly patients with acute pneumopathy.

Both during and subsequent to the control of the acute pneumopathy, the patients with cardiovascular failure presented decompensation phenomena which required special steps for rehabilitation.

Table 2

Medication administered	No. of cases	%
Antibiotics	226	100%
Mucolytics and fluidifiers	226	100%
Bronchodilators	171	75.6%
Corticotherapy	39	17.2%
Cardiotonic agents	178	83.0%
Vasopressor, cardiac and respiratory analeptics	108	48.0%
Heparin	11	5.0%
Diuretics	78	35.0%
Vitamins and reinforcing drugs	147	65.0%
Symptomatic agents	226	100%
Insulin, hypoglycemicant sulfonamides	8	3.1%
Postural drainage	87	38.5%
Diet with hydroelectrolytic additives (+Ca, ClK) (-NaCl)	173	76.5%

The therapy of choice was based mainly on antibiotics, because of the virus-bacterial pathogeny, the decreased resistance of the aged and the superadded pathology. (Table 2).

The therapeutic approach was changed whenever the progress of the disease was not favourable or the antibiogram pointed out a common flora demonstrating the inefficacy of the approach. The discrepancy was noticed between the antibiogram and the clinical evolution, which supports the microbial polymorphism in

the acute pneumopathy. Mention should be made that the antibiotic therapy was maintained (3 weeks on the average) even if we were tempted to discontinue the treatment because of the favourable clinical evolution. The mucolytics and fluidifiants were largely used in order to change the bronchial secretion, because of the defective expectoration in the aged and to avoid the worsening of the respiratory failure. Because of the same reason we used the bronchodilators in order to control the bronchospastic component. The corticotherapy was used with great caution, because of the diabetic and hypertensive patients included in our group and also because of poor cortisone tolerance in the aged. Cardiotonic agents and respiratory analeptics were extensively used even in patients who had not needed cardiotonic agents previously.

Intermittent oxygen therapy and bleedings were used in patients with severe cyanosis considering the polyglobulinemia of the cardio-respiratory failure. Heparin was used in a few cases in injections with 1000 u, one ampoule every 2 days, in order to control coagulability disorders.

Taking into account the specific metabolism in the polydeficient aged patients, hydro-electrolytic, lacking in sodium and rich in potassium chloride, dietary additives were included in the therapeutic schedule.

The aged institutionalized at the Home of the Institute and subjected to Gerovital H<sub>3</sub> treatment displayed a higher resistance to respiratory infections during the epidemics, the clinical progress of the disease was more favourable and mortality lower [1, 21].

As concluding remark, acute pneumopathy in the aged represents one of the most important chapters of clinical geriatrics, because of its high incidence, seriousness, complications and high mortality.

Therefore, prophylactic steps should be taken, such as: well-balanced life-style, avoidance of polluting factors, of crowds during seasonal epidemics, assiduous physical exercise, as well as increase of unspecific immunological resistance, by vaccination and biotrophic treatment.

**Résumé.** On a étudié un nombre de 226 malades âgés entre 61 et 96 ans, avec pneumopathies aiguës; 23,4% du total avaient normalement vieilli, tandis que 76,6% présentaient un vieillissement accéléré. Ces derniers présentaient au moins 2-4 associations morbides, avec prédominance des maladies broncho-pulmonaires chroniques, cardio-vasculaires, diabète, éthyisme, etc.

Les signes cliniques ont été caractérisés surtout par toux à expectoration muco-purulente, fièvre modérée ou même sans fièvre, algies thoraciques et leucocitose. Du point de vue fonctionnel on a constaté chez 35% des sujets une insuffisance respiratoire ou cardio-respiratoire grave.

Du point de vue bactériologique on a mis en évidence la prédominance d'une flore variable non caractéristique, qui vient préciser l'étiologie mixte viro-bactérienne.

Du point de vue radiologique on a remarqué surtout les broncho-pneumonies disséminées, la pneumonie franche n'étant signalée qu'à un nombre réduit de sujets.

On a constaté une fréquente discordance entre la dominance et la persistance de l'aspect radiologique vis-à-vis de celui clinique.

L'incidence des aspects graves a été de 38,1%, l'évolution traînante et avec récrudescente chez 43%, avec complications pleuro-pulmonaires, cardio-vasculaires, rénales, etc. chez 59,8% des sujets.

Le pourcentage de la mortalité a été de 17%, le groupe de polymorbidité ayant une certe prédominance.

Du point de vue anatomo-pathologique, le caractère prédominant des pneumonies — pour les sujets décédés — réside dans les cellules gigantesques sans hépatisation.

La thérapie appliquée a été complexe, au premier plan se situant les antibiotiques,

les mucolytiques, les fluidifiants, les analeptiques, les cardiotoniques, les bronchodilatateurs tout en assurant une diète avec apport hydroélectrolytique et vitaminique approprié aux carences des sujets âgés.

Une évolution clinique favorable, et une mortalité diminuée ont été mises en évidence chez les sujets traités à Gerovital H<sub>3</sub>.

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