



Unusual Microbes for Community-Acquired Pneumonia

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Abstract

Introduction: The diagnosis of Community-Acquired Pneumonia is clinical and radiological. Its treatment by antibiotics is empirical. Performing biological tests to identify the causal microbe is recommended only in the case of severity and hospitalization (CRB65, PSI), and also if there is no response to empirical antibiotic therapy. However, in developing countries, microbes not included in international guidelines - such as tuberculosis and other unusual microbes - could be causal.

Methods: We surveyed 110 cases of Community-Acquired Pneumonia consulting the outpatient clinic of Tishreen University Hospital, Lattakia.

Results: 98/110 cases responded to treatment by macrolides/beta lactams. But the remaining 12 did not. Among these 12 cases, we isolated Tuberculosis bacilli in 10 (5 in sputum, and 5 in BAL), who were successfully treated with anti-tuberculosis protocols.

For one case, the serodiagnosis Vidal for *Salmonella typhi* was positive 1/320, and was treated with success.

The last case of the 12 was the most surprising. There was no response to empirical antibiotics, non tuberculosis bacilli isolated. All cultures and serodiagnosis were negative, but, in the antecedents, we found splenectomy for amebiasis. We performed a lung biopsy and were surprised to see *Entamoeba histolytica* in the lesion. We treated this case with metronidazole and were successful.

Conclusion: International guidelines for CAP management should be provided to developing countries for special causal microbes: above all under the guise of pneumonia tuberculosis can occur, but also other endemic microbes like *Salmonella typhi* and amebiasis.

Keywords: Community Acquired Pneumonia; Developing Countries; Amebiasis; Salmonella

Community-Acquired Pneumonia (CAP) in adults is pneumonia acquired in the community in a non-immuno-compromised host. The typical presenting symptoms are acute fever with shiver, cough and chest pain. Radiologically, the typical pattern is a lobar consolidation with bronchogram. In some cases, there are bronchoalveolar patchy shadows [1].

The causal microbe is mainly streptococcus pneumoniae. Mycoplasma pneumonia is also prevalent, especially in young people. In

severe cases, or co-morbidities, besides pneumococcus, staphylococcus, legionella and gram negative could be the causal pathogen [1-4].

Treatment by antibiotics is empirical with amoxicillin, doxycycline or macrolides if the case is not severe and in the absence of co-morbidities. Otherwise, we prescribe co-amoxiclav associated with macrolides or quinolones alone. If there is a suspicion of Methicillin resistant *staphylococcus* or *pseudomonas aeruginosa*, the appropriate coverage is recommended [2,3].

Hospitalization is required in the case of severe pneumonia according to (PSI or CRB65). It is then recommended to search for the pathogen by sputum gram stain and culture, blood culture, anti-legionella and anti-pneumococcus antibodies in urines [1-3].

It is recommended to search for the causal microbe also when there is a lack of response to empirical treatment [1-3].

We surveyed 110 pneumonia cases presenting to the outpatient clinic of the university hospital of Lattakia, Syria. All but 12 were cured after empirical therapy as described above.

We would like to report on the frequency of tuberculosis pneumonia shown in our local survey (10/110), and on the surprising causal microbes that were found: *Salmonella typhi mirium* in one case and *Entamoeba histolytica* in another.

In the 12/110 cases that were non-respondent to empirical treatment, we searched for Tuberculosis Bacilli (TB) in sputum and found 5 positive cases. We performed bronchoscopy with Broncho-Alveolar Lavage (BAL) for the other 7 non-respondent cases and we isolated TB in 5 cases. The ten patients were cured after TB therapy.

For one of the remaining two cases of the 12 non respondents, although the patient presented a typical clinical history and lobar shadow with bronchogram, he failed to respond to two courses of empirical antibiotics. However he had a positive Vidal test (1/320) and was treated successfully for *salmonella typhi mirium*.

The most surprising case was the last one, presenting with high fever, cough and chest pain. The radiologic presentation was also typically lobar, but there was no response to multiple wide spectrum antibiotics, no TB in sputum or Broncho-Alveolar Lavage, negative Vidal serodiagnosis, and negative blood culture. In the antecedents, this 40-year-old patient had splenectomy which showed *Entamoeba histolytica* in the spleen. Considering the negativity of all tests in this patient, we performed a lung biopsy and were surprised to isolate *Entamoeba histolytica*. The patient was treated and cured clinically and radiologically by Metronidazole (intravenous 750 mg three times daily for 5 days and then oral for three weeks).

In international guidelines for CAP: Tuberculosis bacilli was mentioned as a rare causal of CAP in 2007 (ERS/ATS guidelines [4]), but has been neglected in the new 2019 guidelines [2]. This

is probably due to the low prevalence of tuberculosis in western countries. In developing countries, studies highlight the high ratio of TB, e.g. 55% of CAP cases in Nigeria are caused by TB [5]. It is important to highlight that often under the guise of pneumonia tuberculosis can occur.

We agree with Zar, *et al.* [5] that guidelines for CAP in developing countries should consider and emphasize performing a TB bacteriological search - even if the pattern is typical for lobar pneumonia - if the first empirical treatment with antibiotics is not successful.

The European Respiratory Society defined scores for TB in hospitalized pneumonia: In a European cohort study whose aim was to evaluate risk factors (RFs) for TB in hospitalized CAP, five of the 22 RFs cited by the CDC were significantly associated with TB pneumonia (night sweats, hemoptysis, combined weight loss, combined medical history, recent exposure to TB, history of positive ID, upper lobe infiltrate) [6].

Contrary to TB, the lungs are not a usual site for *salmonella typhi*. One case of pneumonia caused by *Salmonella typhi mirium* was described in an immunocompromised host, accompanied with fever (which had begun 1 month ago) and diarrhea [7].

Lung pleuropneumonia caused by *Entamoeba histolytica* is described as being linked to infected liver in 2% of patients with invasive amoebiasis.

In the absence of liver infection, pleuro-pulmonary amoebiasis could be secondary to the initial site in the colon, by hematogenous spread [8].

One case of amoebiasis abscess in the mediastinum - provoking vena cava syndrome - was reported. This was accompanied by brain abscess without hepatic involvement in a patient treated with sulfasalazine for ulcerative colitis. We considered this patient to be immunocompromised [8].

Our case is one of the rare cases of acute lobar pneumonia without pleural or liver involvement (normal echography) in a non-immunocompromised adult.

We suggest that guidelines should be adapted to local infection patterns in developing countries. This could avoid the exaggerated

and repeated use of large spectrum antibiotics for empirical treatment. It could also save time and lives and, importantly, prevent commensal bacterial resistance to antibiotics [9,10].

Conclusion

International guidelines for CAP management should be provided to developing countries for special causal microbes: above all under the guise of pneumonia tuberculosis can occur, but also other endemic microbes like *Salmonella typhi* and amoebiasis.

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