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Management of community-acquired pneumonia by trained family general practitioners

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SUMMARY

SETTING: Community-acquired pneumonia (CAP) is a respiratory health disease with a high prevalence in the general population. Family general practitioners (GPs) can play an important role in CAP management by reducing unnecessary hospital admissions and, consequently, national health costs.

OBJECTIVE: To assess CAP management by trained GPs.

DESIGN: A course in CAP management, including a risk classification method based only on clinical criteria, was developed within the framework of an educational programme. GPs who participated in the programme (n = 220) were asked to collect data on their CAP patients.

RESULTS: GPs (n = 94, response rate 42.7%) provided information on 370 patients (50% males, aged 18–93 years). The numbers of patients judged to be at low, moderate and high risk were 81%, 13% and 6%, respectively. The admission rate was 19.5%. All home-treated patients had good clinical outcomes. Home treatment was based on quinolones (62%), beta-lactams (23%) and macrolides (15%). The attributable economic mean cost of antibiotic home treatment was €96 per episode (standard deviation 71, range 17–445).

CONCLUSIONS: The good outcomes suggest that GPs managed their CAP patients well, adhering to the content of the CAP management course. The risk evaluation of patients admitted to hospital, based exclusively on clinical elements, was consistent with more complex classification.

KEY WORDS: disease management; family general practitioners; community-acquired pneumonia; antibiotics; educational programme

COMMUNITY-ACQUIRED PNEUMONIA (CAP) is a major respiratory health disease with high prevalence in the general population, clinical heterogeneity and variable severity.[1,2] Both in the United States[3] and in Europe,[4] CAP is the most frequent cause of death due to infection and has implications for health care systems worldwide.[5]

Risk classification is important for CAP management.[6] The Pneumonia Severity Index (PSI)[7] and CURB/CURB65 scores (confusion, urea, respiratory rate, blood pressure, age ⩾65 years)[8,9] are the current prognostic rules for CAP risk classification. The PSI is recommended by the Infectious Diseases Society of America (IDSA)[10–12] and the American Thoracic Society (ATS).[13] It focuses on recognising low-risk patients so that severity is not overestimated,[14] while the CURB/CURB65 score, recommended by the British Thoracic Society (BTS),[15] focuses on identifying high-risk patients so that severity is not underestimated. The PSI also includes complex laboratory and instrument tests, and is less feasible for application in primary care settings than the CURB/CURB65 score.

Management programmes with both favourable clinical outcomes and cost reduction have been standardised.[16,17] However, studies report unnecessary hospitalisation,[3,18–21] which increases costs and represents an additional risk due to potential nosocomial infections.[7] In Italy, more than 90% of CAP costs were associated with hospitalisation (about 500 million euros per year),[4] although 28–37% of admitted patients could have been managed at home.[18,19,21]

Family general practitioners (GPs) can play an important role in CAP management. However, they do not use standardised strategies for admission and thus tend to overestimate the risk of death.[22] GPs' behaviour may be influenced by a number of factors: the difficulty of initial clinical evaluation, the fear that pneumonia can be potentially fatal and the belief that injected antibiotics are more effective than oral ones. Patient preferences may also have a bearing on choosing hospitalisation. A Canadian survey reports that only 16% of family or Emergency Department (ED) physicians say they are confident about assessing CAP.[23]

A working group of the American College of Chest Physicians-Home Care Network, which included representatives of the ATS and the American Association

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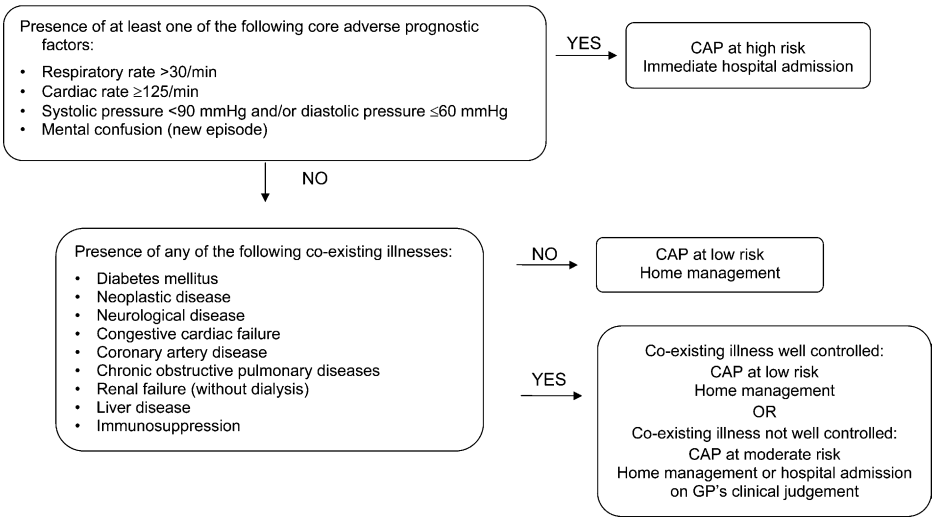


Figure 1 Course of treatment for CAP patients. Risk classification and indication for care settings. CAP = community-acquired pneumonia; GP = general practitioner.

of Respiratory Care, concluded that current literature does not provide sufficient scientific evidence to support clinical practice guidelines.[24] This might explain the suboptimal adherence to guidelines by general physicians.[25]

Although the GP is usually the patient's first point of reference, CAP management by these primary care physicians has been poorly investigated.[6,26,27]

Over the period 1998–2002, the hospitals in the Ferrara area (a region of 160 000 inhabitants in Northern Italy) registered a large number of admissions for CAP without complications, suggesting unnecessary hospitalisation. The Ferrara Pneumonia Project (FPP) was developed to assess CAP management by trained GPs, with particular attention to out-patients.

MATERIALS AND METHODS

In 2003, CAP was the topic of the annual educational programme aimed at GPs working in the Ferrara area (n = 367). They were invited by mail to participate in the programme organised by the Respiratory Physio-Pathology Unit of the Ferrara Hospital and the Italian Group of Evidence-Based Medicine (GIMBE).*

The educational programme was developed in a series of six 7-hour workshops, with a maximum of 40 participants in each workshop.† The response rate was 60% (n = 220 GPs). In the framework of the programme, the recommendations for clinical practice[7–13,15] were resumed in a CAP management course, including: 1) risk classification model/initial care setting, and 2) home treatment with antibiotics.

Risk classification model/initial care setting

The aim was to provide GPs with a model based on clinical criteria that could be put into practice without using laboratory tests or complex instrumentation. The model was based on BTS guidelines,[15] and slightly modified by adding certain clinical risk factors reported in the IDSA/ATS guidelines.[10–13]

Patients with any of the core adverse prognostic factors (core APFs) associated with increased risk of death are at high risk, and should be admitted to hospital immediately (Figure 1). Age is not included in the list of core APFs. Recent studies suggest that age itself is not of prognostic importance.[15] However, age ⩾64 years can be considered an additional risk factor when other adverse prognostic features or complications co-exist.

In patients with no core APFs, other adverse prognostic features need to be considered in estimating risk, as well as the presence of co-morbidity, which has been observed to be associated with a higher risk of death in CAP patients[10–13,15] (co-existing illnesses, Figure 1). Patients with no co-existing illnesses are at low risk of death and can initially be treated at home. Several studies show a significant association of co-existing illnesses with increased risk of death among CAP patients on univariate analysis, but the predictive power for death is low on multivariate analysis.[15] How far these co-existing illnesses contribute to CAP severity is difficult to ascertain, due to variations in CAP definitions and problems in determining the severity of the conditions themselves. Pharmacological treatment may offset the pathological effects associated with increasing risk of death. Patients with 'well controlled' co-existing illnesses may be judged at low or moderate risk on the basis of evaluations by GPs. The choice of initial care setting for moderate-risk patients is also a matter for the GP's clinical judgement.

Antibiotic treatment

Indications for home treatment with antibiotics are based on recommendations in international guide-

* www.gimbe.org.

† www.midiaonline.it/pdf/pneumorama_03_03/pneumorama _03_03.

lines,[10–13,15] which restrict the choice to macrolides, beta-lactams and fluoroquinolones.

Data collection

The 220 GPs who participated in the CAP management programme were asked to collect further data on their CAP patients. The eligibility criteria included radiologically confirmed CAP, age ⩾18 years, no hospital admission within the 15 days before diagnosis (to exclude potential nosocomial pneumonia), no presence of acquired immune-deficiency syndrome (AIDS) or positive serology for the human immunodeficiency virus (HIV).

GPs were provided with an ad hoc paper form to record information, including symptoms, co-morbidity, evaluation of risk classification, care setting, time to clinical recovery, outcome at about 30 days, and, for out-patients, treatment. GPs were proposed a financial incentive of €50 for each completed form.

From April 2003 to December 2004, 94 GPs (participation rate 42.7%) collected information on 370 CAP patients, with an average of four episodes per physician (standard deviation [SD] 3, range 1–18). There was no difference between the GPs who participated in data collection and all GPs in the area, in terms of sex (males 69% vs. 73%), age (mean 49.7 vs. 50 years) or urban/rural site of the surgery (urban 29% vs. 37%). The paper forms were filled out carefully by the GPs. Only five had missing data (patients' date of birth), which were collected by telephoning the GPs in question.

Statistical analysis

Statistical analyses were performed using the Statistical Package for Social Sciences (SPSS Inc, Chicago, IL, USA).

Clinical recovery was defined as absence of symptoms/signs on physical examination in the case of out-patients, or hospital discharge for in-patients. Clinical recovery time was computed as the number of days that elapsed from diagnosis to clinical recovery (out-patients) or hospital discharge (in-patients). Recovery time was defined as long if >14 days (median value).

The mean cost of home treatment was computed according to market prices and official published tariffs. For in-patients, the risk classification was prospectively estimated using the PSI score.[7]

The project was approved by the Ferrara Local Ethics Committee. Informed consent was obtained from patients according to Italian legislation on privacy.

RESULTS

The general characteristics of the CAP patients are shown in Table 1. Both sexes are equally represented. Almost half the patients (47.5%) were aged ⩾64 years. Co-morbidity, including co-existing illnesses related to higher risk of death in CAP patients and other co-morbidities, was present in 62% of the patients. Twenty-nine per cent of the patients (n = 105) displayed co-existing illnesses, most frequently congestive cardiac failure (CCF)/coronary artery disease (CAD) (42%), followed by diabetes (27%), neurological diseases (21%) and chronic obstructive pulmonary disease (COPD) (19%). About 10% of the patients presented a core APF, mainly new mental confusion (7%); temperature >40°C, respiration rate >30/min or cardiac rate >125/min were present in 4% of the cases.

Table 1 Characteristics of CAP patients (n = 370)

Characteristics	n (%)
Age, years, mean ± SD (range)	58 ± 19 (18–93)
Sex	
Male	185 (50)
Female	185 (50)
Smoking habit	
Current smoker	75 (20.3)
Former smoker	90 (24.3)
Never smoker	184 (49.7)
Data missing	21 (5.4)
Working status	
Employed	138 (37.3)
Housewife	18 (4.9)
Student	8 (2.2)
Retired	200 (54.1)
Unemployed	6 (1.6)
Core adverse prognostic factors	35 (9.5)
Co-morbidity	
None	141 (38.1)
Co-existing illnesses	
CCF/CAD	44 (11.9)
Diabetes	28 (7.6)
Neurological disease	22 (5.9)
COPD	20 (5.4)
Neoplastic disease	10 (2.7)
Liver disease	7 (1.9)
Renal disease	6 (1.6)
One co-existing illness	79 (21.4)
Two or more co-existing illnesses	27 (7.3)
Other co-morbidity	
Hypertension	81 (21.9)
Other cardiovascular disease	20 (5.4)
Other pulmonary diseases	9 (2.4)
Other diseases	103 (27.8)

CAP = community-acquired pneumonia; SD = standard deviation; CCF = congestive cardiac failure; CAD = coronary artery disease; COPD = chronic obstructive pulmonary disease.

Risk classification and care setting are shown in Table 2. GPs judged most of the patients to be at a low risk of death. The hospital admission (immediate or later) rate was approximately 20%. GPs decided on immediate in-hospital treatment for 11% of the patients, while 8% were directly admitted by ED physicians at the time of CAP confirmation. No low-risk patients were initially treated in hospital on the GP's decision. All high-risk patients, except for four cases, were admitted immediately.

Figure 2 shows general outcomes by care setting and risk class. The outcome was good for all out-patients and for 93.1% of in-patients.

Clinical recovery time was estimated within the range of 5–70 days (mean 16, SD 8, median 14, 97.5

Table 2 Risk classification of CAP patients as evaluated by GP, and care setting by risk classification (n = 370)

Patients	Risk classification		
	Low n (%)	Moderate n (%)	High n (%)
All	300 (81.1)	47 (12.7)	23 (6.2)
Care setting			
Home (n = 298, 80.5%)	277 (92.3)	18 (38.3)	3 (13.0)
Hospital (immediate admissions) (n = 51, 13.8%)	13 (4.3)	19 (40.4)	19 (82.6)
Admission decided by GP	—	12 (25.5)	8 (34.7)
Admission decided by ED physician	13 (4.3)	7 (14.9)	11 (47.8)
Hospital (later admissions) (n = 21, 5.7%)	10 (3.3)	10 (21.3)	1 (4.3)
Hospital (total admissions) (n = 72, 19.5%)	23 (7.6)	29 (61.7)	20 (86.9)

CAP = community-acquired pneumonia; GP = general practitioner; ED = emergency department.

percentile 38, 44% >14 days). Clinical recovery time was up to 7 days in 6.5% of the patients, 8–10 in 20.2%, 11–14 in 29.2%, 15–20 in 23.3%, 21–30 in 13.2%, 31–40 in 5.1%, and ⩾41 in 2.5%. There was no significant difference in clinical recovery time between out-patients and in-patients.

At follow-up, 82% (n = 304) of the patients were judged to have completely recovered and 16% (n = 60) partially recovered after clinical and radiological (if necessary) evaluation. The frequency of total recovery at follow-up significantly ($P < 0.01$) decreased according to co-existing illnesses: 88% of patients with no co-existing illnesses, 78% of those with one and 68% of those with more than one co-existing illness recovered fully.

Out-patients

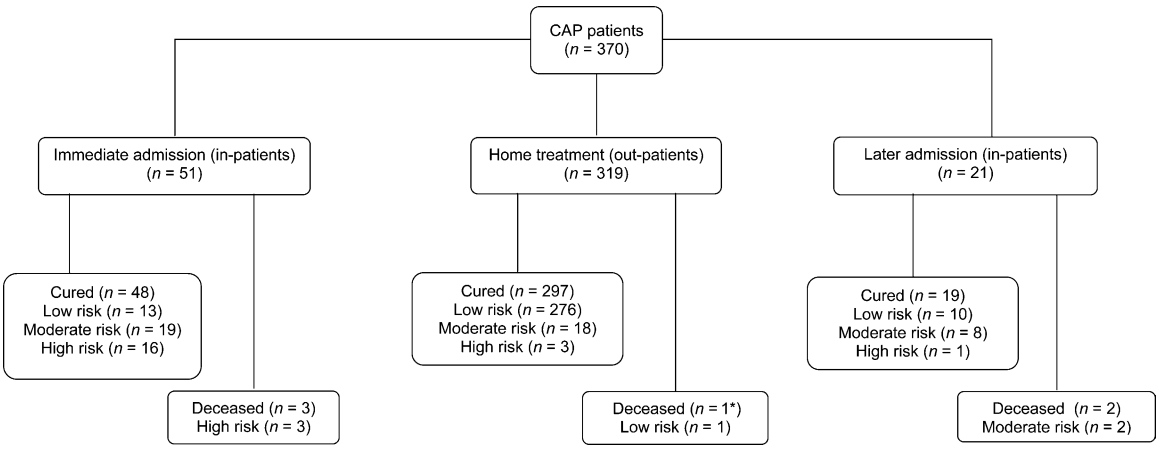
The mean age of the out-patients (n = 298, 49% males) was 55 years (SD 18.5, range 18–89); 24% were current smokers. Co-morbidity, mainly hypertension (20.8%), was present in 56% of the cases. About 22% of the patients (n = 63) displayed co-existing illnesses, usually CAD/CCF (41%), diabetes (24%), neurological diseases (16%) and COPD (14%).

Information on antibiotic treatment is given in Table 3 and Figure 3. GPs mainly prescribed a single antibiotic for initial treatment. The antibiotics generally used were quinolones (60% moxifloxacin, 35% levofloxacin, 5% ciprofloxacin), followed by beta-lactams (37% ceftriaxone, 36% amoxicillin, 17% other molecules) and macrolides (70% clarithromycin, 30% other molecules). The initial antibiotic had to be replaced due to ineffectiveness in 15% of cases (19% of those prescribed a single antibiotic). The use of a single antibiotic (without substitution) was significantly more common in low-risk than in moderate- or high-risk patients (66% vs. 40%, $P < 0.05$).

The range of treatment duration was 5–30 days (mean 13, SD 4, median 10). It was longer in moderate- and high-risk than in low-risk patients (16 vs. 12 days, $P < 0.01$).

After accounting for sex, age, risk classification, co-morbidity and smoking habit, prescription of two antibiotics was associated with a 'long' recovery time (>14 days), compared to prescription of a single antibiotic (without substitution) (odds ratio [OR] 1.80, 95% confidence interval [CI] 0.97–3.35, at a borderline level of significance, $0.1 > P > 0.05$).

At follow-up, 88% (n = 263) of the patients were judged completely cured and 11% (n = 34) partially cured after clinical and radiological (if necessary) evaluation.



*On later admission due to other causes.

Figure 2 Outcomes in CAP patients by site of treatment and risk class. CAP = community-acquired pneumonia.

Table 3 Antibiotic treatment in CAP out-patients (n = 298)

Treatment	n (%)
Single antibiotic (n = 238, 80%)	
QNs	182 (61.1)
Beta-lactams	33 (11.1)
MLs	23 (7.7)
Combination of two antibiotics (n = 60, 20%)	
Beta-lactams + QNs	23 (7.7)
Beta-lactams + MLs	18 (6.0)
MLs + QNs	19 (6.4)

Combined molecules − n (% of combined therapies)

	CLR	CTX	Other CEs	AMX	Other MLs
MXF	7 (11.7)	5 (8.3)	3 (5.0)	6 (10.0)	2 (3.3)
LVX	7 (11.7)	2 (3.3)	2 (3.3)	2 (3.3)	3 (5.0)
CFX	1 (1.7)	1 (1.7)	1 (1.7)		
AMX	3 (5.0)				
CTX	9 (15.0)				3 (5.0)
Other CEs	2 (3.3)				1 (1.7)

CAP = community-acquired pneumonia; QN = quinolone; ML = macrolide; CLR = clarithromycin; CTX = ceftriaxone; CE = cephalosporin; AMX = amoxicillin; MXF = moxifloxacin; LVX = levofloxacin; CFX = ciprofloxacin.

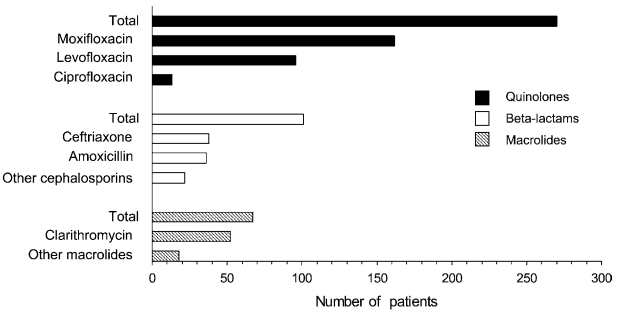


Figure 3 Home treatment. Antibiotics prescribed in the different treatment groups.

The mean number of GP examinations was 3.5 per episode. In Italy, National Health costs are not influenced by the number of examinations performed or the time spent by the GP on clinical evaluation. Medical care is public, i.e., for all citizens, irrespective of socio-economic status. Each GP has a list of potential patients (maximum 1500 persons) and, on a per capita basis, receives a fixed reimbursement based on a predicted annual mean cost per person. The cost of a specialist consultation is about €50. Given that the mean number of consultations was 0.2 per episode, the mean cost attributable to a specialist intervention was evaluated at €10 per patient. The mean cost of antibiotic treatment at home was €96 per episode (SD 71, range 17–445). The total mean cost of home treatment for CAP amounted to about €105 per patient.

DISCUSSION

Despite some limitations, this study provides information about very poorly investigated CAP management by GPs. To our knowledge, this is the first study to evaluate a risk classification that can be used by GPs in CAP.

The sample size is relatively poor, but similar studies have included even smaller samples.[6,27] It is difficult to involve GPs in data collection, as confirmed by the frequently low response rates reported in the literature. Information was obtained from forms filled in by GPs, and we cannot exclude the possibility that cases with more favourable outcomes were preferentially recorded by GPs. However, this seems unlikely insofar as the general characteristics of our CAP patient cohort closely agree with other studies as regards sex and age,[1,6,20,26] current smoking[1] and prevalence of co-morbidity.[26] We have no information on CAP management by these GPs before the Ferrara Pneumonia Project, and we are unable to assess the possible effects of reducing hospitalisation.

Adherence to guidelines by GPs is often suboptimal, possibly because of a lack of knowledge, conflicting advice in guidelines or of a lack of criteria suitable for application in the real world.[24] Our results indicate that GPs closely followed the recommendations of the CAP management course. Disagreement was observed only regarding the evaluation of new mental confusion.

Among low-risk patients, six reported new mental confusion. The underestimation of the risk in four patients was probably due to age (<64 years) and absence of co-existing illnesses. Another patient (aged 80) displayed progressive dementia and no other co-existing illnesses, and mental confusion might thus have been related to dementia. The low-risk classification of another patient (aged 76) with a previous episode of cerebral ischaemia seems inexplicable. Among low-risk patients admitted immediately by ED physicians at the time of radiological examination (n = 13), the risk evaluation by GPs was prospectively confirmed by the PSI score in 11 cases (I to III Fine class). The risk classification was also confirmed by PSI for all low-risk patients later admitted by GPs due to ineffective treatment (n = 10).

Among moderate-risk patients, eight displayed new mental confusion. No other core APF, age <64 years or absence of co-existing illnesses, might explain a classification as moderate instead of high risk. For all patients immediately admitted on the GP's decision (n = 12), moderate risk was confirmed by the PSI score (IV Fine class). Unfortunately, we were able to prospectively evaluate the risk by PSI for only two of the seven moderate-risk patients directly admitted by ED physicians. One was confirmed to be at moderate risk and the other at low risk.

All high-risk patients displayed at least one of the core APFs, mainly new mental confusion, except for two patients, a female aged 52 with myasthenia gravis, and a male aged 74 with COPD, in a vegetative state. The prospective evaluation by PSI indicated that these patients were in I and III Fine class, respectively. We should point out that the computation of the PSI score does not take into account COPD or neurological

illnesses. Most high-risk patients were hospitalised immediately. Four patients were not admitted due to lack of hospital bed space, refusal by the patient or on family request. Except for the two patients reported above, high risk was prospectively confirmed by the PSI score.

The hospitalisation rate agrees with that reported by other studies, which used more complex risk classification rules.[6,27] After prospective evaluation by PSI (available for 44/51 admitted patients), there was apparent unnecessary hospitalisation for 14 cases (about 32%, 27.7% of which were attributable to ED physicians).

The GPs usually prescribed orally administered fluoroquinolones. This is in disagreement with the results obtained by Sanguinetti et al. in another Italian study,[26] who found that the GPs mainly prescribed cephalosporins in both single and combined treatment. The use of cephalosporins normally implies intramuscular administration. Orally administered drugs are less expensive and are as effective as injectable drugs.[22] Quinolones are well tolerated and resistance to them remains low for most aetiological CAP agents.[17] Clinical evidence supports the notion that monotherapy based on moxifloxacin or levofloxacin is as effective as the association of beta-lactams with macrolides.[28–30] We found that fluoroquinolones were effective in 92% of cases, in agreement with recent pharmacological studies.[28,31]

As reported, the total cost of CAP treatment was about €105 per out-patient. Given that in Italy the mean cost per in-patient has been evaluated at about €1500,[32] home treatment results in a large economic advantage in addition to higher satisfaction for the patients, who generally prefer to be treated at home.[33]

CONCLUSION

The satisfactory outcomes of this study suggest that GPs managed their CAP patients well, and that they adhered to the content of the CAP management course. The risk evaluation of patients who were hospitalised based on exclusively clinical elements was consistent with more complex classification rules.

Acknowledgements

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References

1 Viegi G, Pistelli R, Cazzola M, et al. Epidemiological survey on incidence and treatment of community-acquired pneumonia in Italy. Respir Med 2006; 100: 46–55.
2 File T M. Community-acquired pneumonia. Lancet 2003; 362: 1991–2001.
3 Aliyu Z Y, Aliyu M H, McCormick K. Determinants for hospitalisation in 'low-risk' community-acquired pneumonia. BMC Infect Dis 2003; 3: 11.
4 Blasi F, Bulfoni A, Concia E, and the Multidisciplinary Group. Polmonite acquisita in comunità in 'gestione delle infezioni delle basse vie respiratorie'. GIMI (Italian Journal of Internal Medicine) 2002; 1 (Suppl): S1–S23. [Italian]
5 Bauer T T, Welte T, Ernen C, et al. Cost analyses of community-acquired pneumonia from the hospital perspective. Chest 2005; 128: 2238–2246.
6 Fantin B, Aubert J P, Unger P, Lecoeur H, Carbon C. Clinical evaluation of the management of community-acquired pneumonia by general practitioners in France. Chest 2001; 120: 185–192.
7 Fine M J, Auble T E, Yealy D M, et al. A prediction rule to identify low-risk patients with community-acquired pneumonia. N Engl J Med 1997; 336: 243–250.
8 Lim W S, Macfarlane J T, Boswell T C, et al. Study of community-acquired pneumonia aetiology (SCAPA) in adults admitted to hospital: implications for management guidelines. Thorax 2001; 56: 296–301.
9 Lim W S, van der Eerden M M, Laing R, et al. Defining community-acquired pneumonia severity on presentation to hospital: an international derivation and validation study. Thorax 2003; 58: 377–382.
10 Bartlett J G, Dowell S F, Mandell L A, File T M Jr, Musher D M, Fine M J. Practice guidelines for the management of community-acquired pneumonia in adults. Infectious Diseases Society of America. Clin Infect Dis 2000; 31: 347–382.
11 Mandell L A, Marrie T J, Grossman R F, Chow A W, Hyland R H. Canadian guidelines for the initial management of community-acquired pneumonia: an evidence-based update by the Canadian Infectious Diseases Society and the Canadian Thoracic Society. The Canadian Community-Acquired Pneumonia Working Group. Clin Infect Dis 2000; 31: 383–421.
12 Mandell L A, Bartlett J G, Dowell S F, File T M Jr, Musher D M, Whitney C. Infectious Diseases Society of America. Update of practice guidelines for the management of community-acquired pneumonia in immunocompetent adults. Clin Infect Dis 2003; 37: 1405–1433.
13 Niederman M S, Mandell L A, Anzueto A, et al. Guidelines for the management of adults with community-acquired pneumonia. Diagnosis, assessment of severity, antimicrobial therapy and prevention. Am J Respir Crit Care Med 2001; 163: 1730–1754.
14 Aujesky D, Auble T E, Yealy D M, et al. Prospective comparison of three validated prediction rules for prognosis in community-acquired pneumonia. Am J Med 2005; 118: 384–392.
15 British Thoracic Society. Guidelines for the management of community-acquired pneumonia in adults. Thorax 2001; 56 (Suppl IV): 1–64.
16 Scott G, Scott H, Turley M, Baker M. Economic cost of community-acquired pneumonia in New Zealand adults. NZ Med J 2004; 117: U933.
17 Tan J S, File T M Jr. Management of community-acquired pneumonia: a focus on conversion from hospital to the ambulatory setting. Am J Respir Med 2003; 2: 385–394.
18 Artom A, Artom P, Rattenni S, Castello C, Lo Pinto G. MIPS: Multicenter Italian Pneumonia Study. Results of an observational, prospective and multicenter study on the clinical approach to community-acquired pneumonia. Infect Med 2004; 12: 181–185.
19 Richeldi L, De Guglielmo M, Fabbri L M, et al. Management of CAP using a validated risk score. Thorax 2005; 60: 172–173.
20 Bartolome M, Almirall J, Morera J, et al. A population-based study of the costs of care for community-acquired pneumonia. Eur Respir J 2004; 23: 610–616.
21 Riccioni G, Di Pietro V, Staniscia T, et al. Community-acquired pneumonia in internal medicine: a one-year retrospective study based on pneumonia severity index. Int J Immunopathol Pharmacol 2005; 18: 575–586.
22 Carratala J, Fernandez-Sabe N, Ortega L, et al. Outpatient care compared with hospitalization for community-acquired

pneumonia: a randomised trial in low-risk patients. Ann Intern Med 2005; 142: 165–172.
23 Krueger P, Loeb M, Kelly C, Edward H G. Assessing, treating and preventing community-acquired pneumonia in older adults: findings from a community-wide survey of emergency room and family physicians. BMC Fam Pract 2005; 6: 32.
24 Ramsdell J, Narsavage G L, Fink J B. Management of community-acquired pneumonia in the home: an American College of Chest Physicians clinical position statement. Chest 2005; 127: 1752–1763.
25 Flanders S A, Halm E A. Guidelines for community-acquired pneumonia: are they reflected in practice? Treat Respir Med 2004; 3: 67–77.
26 Sanguinetti C M, De Benedetto F, Donner C F. GP management of community-acquired pneumonia in Italy: the ISOCAP study. Monaldi Arch Chest Dis 2005; 63: 23–29.
27 Laurichesse H, Gerbaud L, Baud O, Gourdon F, Beytout J, Study Group of General Practitioners. Hospitalisation decision for ambulatory patients with community-acquired pneumonia: a prospective study with general practitioners in France. Infection 2001; 29: 320–325.
28 Segreti J, House H R, Siegel R E. Principles of antibiotic treatment of community-acquired pneumonia in the outpatient setting. Am J Med 2005; 118 (Suppl): S21–S28.
29 Zervos M, Mandell L A, Vrooman P S, et al. Comparative efficacies and tolerabilities of intravenous azithromycin plus ceftriaxone and intravenous levofloxacin with step-down oral therapy for hospitalised patients with moderate to severe community-acquired pneumonia. Treat Respir Med 2004; 3 (Suppl): S329–S336.
30 Grossman R F, Rotschafer J C, Tan J S. Antimicrobial treatment of lower respiratory tract infections in the hospital setting. Am J Med 2005; 118: S29–S38.
31 Miravitlles M. Moxifloxacin in respiratory tract infections. Expert Opin Pharmacother 2005; 6: 283–293.
32 Dal Negro R, Berto P, Tognella S, Quareni L. Global Outcomes in Lung Disease Study Group. Cost-of-illness of lung disease in the TriVeneto region, Italy: the GOLD study. Monaldi Arch Chest Dis 2002; 57: 3–9.
33 Coley C M, Li Y H, Medsger A R, et al. Preferences for home vs. hospital care among low-risk patients with community-acquired pneumonia. Arch Intern Med 1996; 156: 1565–1571.

RÉSUMÉ

CONTEXTE : La pneumonie acquise dans la collectivité (CAP) est une maladie respiratoire à haute prévalence dans la population générale. Les médecins de famille généralistes (GP) pourraient jouer un rôle important dans la prise en charge de la CAP pour limiter les hospitalisations inutiles et, par voie de conséquence, les coûts nationaux de santé.

OBJECTIF : Evaluer la prise en charge de la CAP par des GP bien formés.

SCHÉMA : Dans le cadre d'un programme d'éducation, un cours sur la prise en charge de la CAP incluant une méthode de classement des risques basée sur des critères exclusivement cliniques a pu être développé. Les GP ayant participé au programme (n = 220) ont été sollicités pour colliger des données ultérieures sur leurs patients CAP.

RÉSULTATS : Les GP (n = 94 ; taux de réponse 42,7%) ont fourni des informations sur 370 patients (50% hommes ; âge 18 à 93 ans). Les patients ont été considérés comme étant à risque faible, moyen ou élevé respectivement dans 81%, 13% et 6% des cas. Le taux d'hospitalisation a été de 19,5%. Tous les patients traités à domicile ont eu un résultat clinique favorable. Le traitement à domicile a reposé sur les quinolones (62%), les béta-lactames (23%) et les macrolides (15%). Le coût économique attribuable moyen d'un traitement antibiotique à domicile a été de 96 € par épisode (DS 71 ; extrêmes 17–445).

CONCLUSIONS : Les bons résultats suggèrent que les GP ont bien pris en charge leurs patients CAP, et ont bien respecté la prise en charge de la CAP proposée dans le cours. Concernant les patients admis à l'hôpital, l'évaluation des risques basée sur des éléments purement cliniques a été cohérente avec des règles de classement plus complexes.

RESUMEN

MARCO DE REFERENCIA : La neumonía extrahospitalaria (CAP) constituye una enfermedad pulmonar con alta prevalencia en la población general. Los médicos de familia (GP) podrían tener una función importante en el tratamiento de la CAP, a fin de reducir las hospitalizaciones innecesarias y en consecuencia los costos nacionales de salud.

OBJETIVO : Evaluar el tratamiento de las CAP por GP adiestrados.

MÉTODO : En el marco de un programa educativo, se concibió un curso sobre el tratamiento de la CAP, exclusivamente basado en los criterios clínicos. Se solicitó a los GP que participaron en el programa (n = 220) que recopilaran datos adicionales sobre sus pacientes con CAP.

RESULTADOS : Los GP (n = 94, tasa de respuesta 42,7%) aportaron información sobre 370 pacientes (50% hombres, edad entre 18 y 93 años). Los pacientes se clasificaron de bajo riesgo 81%, de riesgo medio 13% y de alto riesgo 6%. La tasa de hospitalización fue de 19,5%. Todos los pacientes tratados a domicilio alcanzaron un desenlace clínico favorable. El tratamiento domiciliario se basó en quinolonas (62%), betalactámicos (23%) y macrólidos (15%). El costo medio atribuible a la antibioticoterapia a domicilio fue de 96 € por episodio (desviación estándar 71 entre 17 y 445).

CONCLUSIONES : Los desenlaces clínicos favorables indican que los GP manejaron en forma adecuada a los pacientes con CAP y cumplieron con las recomendaciones del curso. La evaluación del riesgo de los pacientes hospitalizados, basada exclusivamente en elementos clínicos, estuvo acorde con las reglas de clasificaciones más complejas.