Do guidelines influence medical practice? Changes in management of acute pancreatitis 7 years after the publication of the French guidelines

Vinciane Rebours[a], Philippe Lévy[a], Jean-François Bretagne[b], Gilles Bommelaer[c], Pascal Hammel[a] and Philippe Ruszniewski[a]

Objectives **The elaboration and publication of guidelines should help homogenizing the management of frequent diseases with high mortality and morbidity rates, such as acute pancreatitis.**

Aim **To evaluate the implementation of French guidelines on the management of acute pancreatitis (AP), and to correlate changes with a received medical training course.**

Methods **In 2001 (before the Consensus Conference) and 2008, the same questionnaire dealing with recommendations for AP management was sent to the French gastroenterology Units. Responses in 2001 and 2008 were compared.**

Results **One hundred and seventy-six questionnaires were analyzed (public hospitals: 62%, academic hospitals: 20%, private institutions: 18%). In 2008 (vs. 2001), lipase levels were measured for establishing AP diagnosis by 99% (vs. 83%). To evaluate AP severity, a computed tomography (CT) scan was performed at 48 h by 69% (vs. 29%, $P \leq 0.001$). The most used severity index was the CT Balthazar score 76% (vs. 55%, $P \leq 0.001$). Antibiotic prophylaxis and artificial nutrition by enteral route were proposed by 20% (vs. 57%) and 58% (vs. 25%) for necrotizing pancreatitis. Practices were more frequently in agreement with the guidelines in public nonacademic and academic hospitals. Training course on AP management was associated with a more appropriate use of CT scan for the evaluation of AP severity and of antibiotics.**

Conclusion **Major changes were noticed since the publication of the French guidelines. Although establishing guidelines is an expensive process, it does increase compliance with best evidence-based practice.** ***Eur J Gastroenterol Hepatol*** **24:143–148 © 2012 Wolters Kluwer Health | Lippincott Williams & Wilkins.**

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[a]Pôle des Maladies de l'Appareil Digestif, Pancreatology Unit, Beaujon Hospital, Denis Diderot-Paris VII University, AP-HP, Clichy, [b]Gastroenterology Unit, Pontchaillou Hospital, Rennes and [c]Gastroenterology Unit, CHU Estaing, Clermont-Ferrand, France

Correspondence to Dr Vinciane Rebours, MD, Pôle des Maladies de l'Appareil Digestif, Pancreatology Unit, Beaujon Hospital, Denis Diderot-Paris VII University, AP-HP, 100, boulevard du général Leclerc 92118 Clichy Cedex, France
Tel: +33 (0)1 40 87 52 25; fax: +33 (0)1 42 70 37 84;
e-mail: vinciane.rebours@bjn.aphp.fr

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Introduction

Acute pancreatitis (AP) is a rather common disease. Its incidence in Europe has been evaluated in 10–32/100 000 inhabitants [1–2]. Global mortality has been evaluated in 5% (30% in the case of necrotizing pancreatitis) [3]. Within the last decade, several National Societies of Gastroenterology have edited guidelines to optimize and to homogenize medical practice. Implementation of guidelines is justified because of high prevalence of the disease, high morbidity and mortality rates, and heterogeneity in practices within the same country [4–7].

In 2001, the French Society of Gastroenterology organized a national consensus to establish and publish French guidelines for the management of acute pancreatitis. Before gathering the experts and performing an exhaustive analysis of the literature, the committee board organized a national audit through a questionnaire that was sent to all the French Gastroenterology Units, leading to a confirmation of the usefulness of such guidelines [8]. Responses to questionnaires clearly differed from the main international publications in the literature and were heterogeneous according to the type of health centers.

However, the cost of such organization is high because of the needs of major manpower and time for exhaustive analysis of data. The cost of the French consensus meeting for AP (63 experts) was around 450 000 Euros. This cost has to be balanced with the impact of recommendations in terms of morbidity, mortality, and even the cost burden of the disease [9].

The impact of such national guidelines has already been a matter of debate because practices and medical habits are usually difficult to modify. Audits about AP have already been performed in Italy, Germany, and England with quite disappointing results [10–17]. In Germany, the treatment of AP differed substantially from the recommendations among German surgeons [18]. Only 11% of the responders stated that they strictly followed all guidelines [14].

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The aims of our study were to evaluate the medical practices in the management of acute pancreatitis, to assess the impact and the compliance to the French guidelines on practices by comparing years 2001 and 2008, and to determine whether any specific training about consensus guidelines on AP would have an impact on management.

Methods

Data source

Data source was based on answers to questionnaires sent to the Gastroenterology Units. In 2001, one questionnaire was sent to 336 randomly selected Units in order to prepare the French Consensus Conference for the management of acute pancreatitis. The aim was to evaluate French practices and knowledge in managing acute pancreatitis. In 2008, the same questionnaire was sent to the same panel of French Gastroenterology Units (private and public institutions). This included 325 departments, among which 198 public health hospitals and 127 private institutions. The mail was sent to the Medical Unit Head. A cover letter invited gastroenterologists to join a collaborative study aiming at investigating the management of AP in France. A stamped envelope was included to optimize the rate of the responders. The Medical Unit Head was responsible for collecting the answers, which reflect the practices of the Unit.

Questionnaire

The questionnaire comprised two parts. The first part was identical in 2001 and 2008, and included 22 questions about diagnosis, site of hospitalization, evaluation of severity, artificial nutrition, and antibiotic treatment. The second part evaluated demographic data, experience in medical care and area of specialty of the responders, as well as the characteristics of the Unit. Continuing Medical Education programs about pancreatitis attended by the physicians were also evaluated (number of training courses, subscription to international or national medical journals, and reception of the guidelines by mail or e-mail). All these items are summarized in Table 1.

Table 1 Data of the questionnaires sent in 2001 (part 1) and in 2008 (parts 1 and 2)

Part 1	Items
1	Use of pancreatic enzyme levels for AP diagnosis: lipase or amylase blood levels or urinary amylase level
2	Delay of CT scan procedure to diagnose AP: At admission or at 48 h
3	Clinical, biological or morphological scores used for AP severity evaluation: C-reactive protein blood level, CT scan severity index
4	Morphological examinations used to diagnose a biliary AP: EUS, MRI
5	Type of unit to admit and treat severe AP
6	Criteria to admit AP patient in an ICU
7	Indication for emergency sphincterotomy for biliary AP: Angiocholitis or all cases of biliary AP
8	Indications for preventive antibiotics treatment: all patients, pancreatic necrosis, exceptionally
9	Indications for analogues of somatostatine treatment
10	Indications for necrosis aspiration to diagnose infection: all patients, pancreatic necrosis, exceptionally, clinical sign of sepsis
11	Indication for artificial nutrition: all patients, pancreatic necrosis, exceptionally
12	Route for artificial nutrition: enteral or parenteral route
13	Location of feeding tube for enteral nutrition: duodenal or gastric location
14	Indication for gastric aspiration: all patients, vomiting, severe acute pain, exceptionally
15	Timing of oral refeeding after AP
16	Indication for surgical resection of necrosis: all patients, infected necrosis, severe organ failure
17	Management of noncollected infected necrosis: surgical resection, antibiotics only, endoscopic drainage
18	Management of collected infected necrosis: surgical resection, antibiotics only, endoscopic drainage
19	Use of preventive procedures during ERCP to prevent AP
20	Indication and timing to repeat CT scan in case of severe AP
21	Use of opiates analgesics
22	Indications and management of cholecystectomy for biliary AP
Part 2	**Items**
1	Category of hospital
2	Number of beds of the institution: <100, 100–500 and >500 beds
3	Equipment of the hospital (CT scan, MRI, endoscopic ultrasound sonography)
4	Number of AP patients/year/hospital
5	Gender of the responder
6	Age of the responder
7	Number of participants to national training courses of gastroenterology per year
8	Subscription to an international or national journal of gastroenterology
9	Specific training course received about pancreatitis management
10	French guidelines personally received

AP, acute pancreatitis; ERCP, endoscopic retrograde cholangiopancreatography; EUS, endoscopic ultrasound.

Statistical analysis

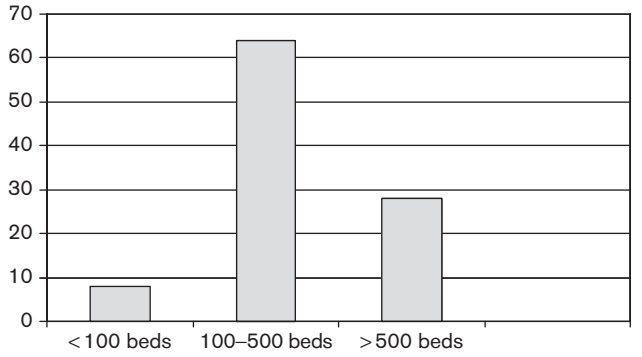
Continuous data were expressed as median and range. All questions were categorical or continuous, no freehand answer was permitted. The differences between the responses of the 2001 and 2008 questionnaires were compared using the Kruskal–Wallis test for continuous data and the χ^2-test or the Fisher's exact test as necessary for categorical data. Responses were analyzed according to received medical training courses. The data were analyzed with the SAS 9.1 statistical software for Windows (SAS Institute Inc., Cary, North Carolina, USA). All statistical tests were two-sided. The critical level of statistical significance was $P < 0.05$.

Results

Characteristics of the responders status

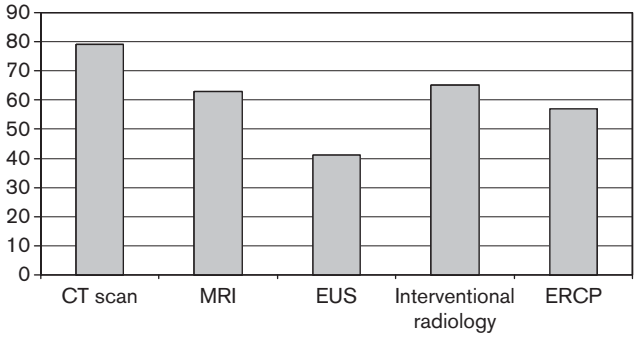
In 2008, 20, 62, and 18% of the responders belonged to the academic, public, nonacademic or private institutions, respectively. The size of the institutions, the available morphological procedures, and the number of admissions per unit and per year for AP are described in Figs 1–3. Ninety and 49% of the responders were readers of French or English language journals of gastroenterology, respectively. Since 2001, responders took part in specific training courses on management for AP one, two or three times in 49, 26. or 5%, respectively. Nineteen percent of the responders did not attend a specific formation.

Fig. 1



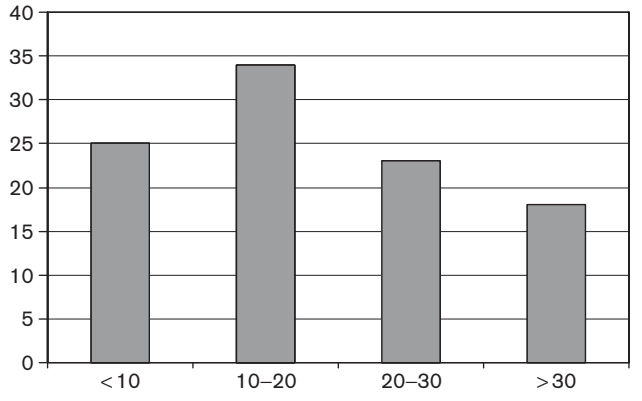
Size of the institutions.

Fig. 2



Available morphological procedures in institutions. ERCP, endoscopic retrograde cholangiopancreatography; EUS, endoscopic ultrasound.

Fig. 3



Number of admissions per unit and per year for acute pancreatitis.

Major findings in 2001 before editing French guidelines

In 2001, AP was diagnosed regarding the amylase blood level in 97% of the cases and the severity was evaluated by a computed tomography (CT) scan performed at admission in 70%. In the case of biliairy AP complicated by cholangitis, emergency sphincterotomy was performed in 24% of the cases only. Prophylactic use of antibiotics in necrotic AP was performed by 57% of the gastroenterologists. Artificial nutrition was proposed in 75% of the patients with necrosis, by a parenteral route in 75% of the cases. In the case of severe acute pain, a nasogastric tube was systematically inserted by 35%.

Changes between 2001 and 2008

French guidelines are summarized in Table 2. In 2001 and 2008, 134 of 336 (40%) and 176 of 325 (54%) units responded to the survey, respectively. All the results are summarized in Table 2. Diagnosis of AP in 2008 (vs. 2001) relied on serum lipase and amylase levels determination for 99 and 46% of the physicians (vs. 83 and 97%, $P < 0.001$). To evaluate AP severity, CT scan was performed at admission and after 48 h by 28 and 69% of the responders (vs. 70 and 29%, $P < 0.001$). The most widely used severity scores were the CT Balthazar score and the C-reactive protein blood level (76 vs. 55%, $P = 0.0002$ and 60 vs. 39%, $P = 0.09$, respectively). Antibiotics were prescribed in order to prevent infection of necrosis by 20% of the responders (vs. 57%, $P < 0.001$). Artificial nutrition was prescribed by enteral route in patients with necrotizing pancreatitis by 58% (vs. 25%, $P < 0.001$) of the responders. No differences were found between 2001 and 2008 regarding indications for aspiration of necrosis to diagnose infection, indications for artificial nutrition, and the management of collected or noncollected infected necrosis.

Comparison between answers in 2008 and French guidelines

In 2008, responses still differed from French guidelines for AP diagnosis and management. Contrary to guidelines, amylase instead of lipase blood level was used for AP diagnosis by 46% of the responders. CT scan was performed at admission (and not at the 48 h) to evaluate the severity of AP by 28%. The C-reactive protein level and Balthazar index for the severity evaluation were not performed by 40 and 24%, respectively. Prophylaxis with antibiotics was used by 20%. Fine-needle aspiration was not performed by 29% of the responders to confirm infection of pancreatic necrosis in the case of clinical or biological suspicion. Finally, when artificial feeding was indicated, 42% of the responders inappropriately proposed total parenteral, instead of enteral nutrition.

Correlation between responders status and adequate management of acute pancreatitis

Correlations between subscriptions to an English language journal, participation to specific sessions of training, and the type of centers (private, academic, or public nonacademic institutions) was searched according to the answers of the first 22 items. All results are summarized in Table 3.

Table 2 Changes between 2001 and 2008

Item	Before publication of the guidelines 2001 *N* (%)	After publication of the guidelines 2008 *N* (%)	French guidelines	*P* value
Diagnosis of AP	–	–	–	–
Lipase blood level	111 (83)	174 (99)	Yes	<0.0001
Amylase blood level	130 (97)	81 (46)	No	<0.0001
Delay of CT scan to diagnose AP	–	–	–	–
48 h	39 (29)	121 (69)	Yes	<0.0001
At admission	94 (70)	47 (28)	No	<0.0001
Severity evaluation of AP	–	–	–	–
CRP	94 (39)	106 (60)	Yes	0.09
CT scan severity index	74 (55)	134 (76)	Yes	0.0002
Indication of sphincterotomy in emergency for biliary AP	–	–	–	–
Angiocholitis	32 (24)	136 (77)	Yes	<0.0001
In all cases of biliary AP	47 (35)	21 (12)	No	<0.0001
Use of preventive antibiotics	–	–	–	–
For all patients	25 (19)	14 (8)	No	0.008
If pancreatic necrosis	76 (57)	37 (20)	No	<0.0001
Exceptionally	28 (21)	107 (61)	Yes	<0.0001
Indications for necrosis aspiration to diagnose infection	–	–	–	–
For all patients	4 (3)	4 (2)	No	0.9
Exceptionally	40 (30)	47 (27)	No	0.6
In case of clinical sign of sepsis	83 (62)	123 (71)	Yes	0.17
Indication for artificial nutrition	–	–	–	–
For all patients	24 (18)	23 (13)	No	0.3
If pancreatic necrosis	100 (75)	117 (68)	Yes	0.15
Exceptionally	9 (7)	32 (19)	No	0.005
Route for artificial nutrition	–	–	–	–
Enteral nutrition	33 (25)	100 (58)	Yes	<0.0001
Parenteral nutrition	100 (75)	73 (42)	No	<0.0001
Indication for gastric aspiration	–	–	–	–
In all patients	16 (12)	7 (4)	–	
If vomiting	69 (52)	121 (69)	No	0.01
If severe acute pain	47 (35)	25 (14)	Yes	0.002
Exceptionally	1 (1)	30 (17)	No	<0.0001
Surgical resection of necrosis	–	–	–	–
For all patients	0	0	No	<0.0001
In case of infected necrosis	12 (9)	64 (38)	Yes	<0.0001
In case of severe organ failure	45 (34)	30 (18)	No	0.001
Management of noncollected infected necrosis	–	–	–	–
Surgical resection	15 (11)	24 (14)	No	0.6
Antibiotics only	98 (73)	119 (70)	Yes	0.35
Endoscopic drain	16 (12)	27 (16)	No	0.48
Management of collected infected necrosis	–	–	–	–
Surgical resection	36 (27)	29 (17)	Yes	0.03
Antibiotics only	8 (6)	8 (5)	No	0.76
Endoscopic drainage	98 (73)	133 (78)	Yes	0.72

AP, acute pancreatitis; CRP, C-reactive protein.

Table 3 Correlation between responders status and adequate management of acute pancreatitis

Item	Lipase blood level for AP diagnosis *N* (%)	CT scan timing for AP severity *N* (%)	No antibiotics prophylaxis in the case of pancreatic necrosis *N* (%)	Enteral nutrition route *N* (%)
Institution type	–	–	–	–
Academic (*N*=35)	35–(100%)	25–(71%)	22–(63%)	25–(71%)
General (*N*=108)	107–(99%)	79–(74%)	72–(67%)	68–(63%)
Private (*N*=33)	33–(100%)	15–(48%)	13–(40%)	9–(27%)
P	NS	0.01	0.01	0.04
Subscription to an English journal	–	–	–	–
Yes (*N*=81)	80–(99%)	61–(75%)	52–(64%)	53–(65%)
No (*N*=83)	82–(99%)	50–(60%)	48–(58%)	36–(43%)
P	NS	NS	NS	0.007
Training courses about AP since 2001	–	–	–	–
N=0 (*N*=32)	32–(100%)	16–(50%)	18–(56%)	13–(41%)
$N \geq 1$ (*N*=131)	129–(99%)	94–(72%)	82–(63%)	75–(57%)
P	NS	0.03	0.03	NS

AP, acute pancreatitis; EN, enteral nutrition; NS, not significant; PN, parenteral nutrition.

Eighty percent of the responders received specific training courses about AP since 2001. Adequate choice of the enteral route for artificial nutrition was more often observed among subscribers to English language journals.

Gastroenterologists who attended specific training courses about French guidelines had more often adequate timing for CT scan evaluation of AP severity (48 h) (72 vs. 50%, $P = 0.03$) and did not use preventive antibiotics for necrotizing pancreatitis (63 vs. 56%, $P = 0.03$).

The number of training courses was not different according to the type of institution. However, subscription to an English language medical journal was more frequent in academic hospitals (77%) than in public nonacademic hospitals (48%) or in private institutions (27%), $P < 0.001$.

Discussion

This study compared the management of AP before and after the publication of the French guidelines and looked for associations between changes in practices and Continuous Medical Education attendance [9]. Significant differences were noted about AP diagnosis and treatment of complications. In 2008, AP diagnosis relied more frequently on lipase blood level and CT scan to evaluate AP severity mainly performed 48 h after admission. The most used severity indexes were the CT scan severity index and the C-reactive protein blood level. Prevention with antibiotics was less often prescribed in the case of necrotizing pancreatitis. In 2008, enteral route was most often chosen for artificial nutrition when indicated. Practices were more frequently in agreement with the national guidelines in academic institutions. Physicians who received specific training about French guidelines for AP (60%) did better than the others for CT scan timing and adequate use of preventive antibiotics. Subscribers to an English language journal (50%) did better than the others for CT scan timing and route of artificial nutrition.

The publication of guidelines aims at indicating the best clinical practices for the diagnosis and the management of a specific disease. It relies on a complete review of the evidence-based literature. To justify such a time and resource-consuming organization, the disease should to be frequent and/or severe with recent available data in the literature bearing a high degree of evidence. Guidelines should help decrease morbidity, mortality and costs, and standardizing the medical management in order to provide a rational basis for referral of patients to specialized units and to provide the same quality of management for all patients [19–20]. AP meets these criteria because of its incidence (50–80 cases/100 000 inhabitants per year in North European countries) [1–2], and a mortality rate between 3–30% according to severity [3].

The interest of Consensus Conference is regularly a matter of debate because of its costs, involving time, and manpower [20]. Moreover, habits of practices are usually difficult to change and cost-benefit analyses are lacking in the literature. No study clearly reported the medical economic impact of national guidelines for AP management [20], and studies about the implementation of national guidelines in AP were quite disappointing. In Japan, national guidelines were published in 2002 [21]. A recent Japanese study found changes in practice after publication of guidelines. For AP diagnosis, the use of lipase blood level was more frequent (< 0.001) and a CT scan was realized more often to evaluate the AP severity. A nasogastric tube with enteral feeding was proposed for severe AP and preventive antibiotics administration was discarded in moderate and mild AP. The management as recommended by the guidelines was, however, not adhered to as widely as expected. For example, almost all responders replied that they continued to measure amylase blood level for AP diagnosis, whereas only 75% measured lipase blood level. The enteral feeding for severe pancreatitis significantly increased although disappointingly (9 vs. 28%, $P < 0.001$) [22]. A study by German surgeons revealed that only 11% of the respondents stated that they strictly applied all guidelines published by the International Association of Pancreatology. Thirty-one and 27% followed all except one recommendation, all but two recommendations or suggested that their treatment differed substantially from the guidelines, respectively. A similar trend in lack of adherence to German guidelines was noticed when most surgeons agreed on the need to prescribe prophylactic antibiotics for severe AP, and when less than 50% performed a fine needle aspiration of necrosis to prove infection in patients with septic signs. By contrast, almost all gastroenterologists declared to be aware of the German guidelines. About 50% knew of the contents of the guidelines of the Atlanta Symposium and of the British Gastroenterology Society, whereas two-thirds were aware of other international guidelines. The noncompliance with published data was generally associated to data based on insufficient evidence, expert opinion only or when controlled trials were needed to solve controversial issues. In Italy, management of 1006 patients with AP was analyzed according to the Italian recommendations. Authors indicated a lack of compliance mainly for interventional or surgical indications [13–14].

In this study, significant changes in clinical practice were noted for diagnosis and management of AP since 7 years. However, as in other countries [23–28], compliance rate to national guidelines was rather disappointing in 2008: amylase blood level was still determined by 48% of the physicians for AP diagnosis; CT scan was still performed at admission in 28% of the cases, and C-Reactive Protein was not used as a marker of severity by 40%. In the case of sepsis, a fine-needle aspiration of necrosis was not

performed by 29% of the physicians. A trend to comply with French recommendations was observed in attendees, in subscribers to English language journals, and in academic hospital. These responders were in better agreement with recommendations regarding the use of the CT scan, the use of preventive antibiotics, and enteral nutrition. As no difference existed in the type and number of training courses followed in different types of institutions, it could be suggested that changes observed in practice in 7 years might be because of the academic education of physicians and the capacity and facilities to modify practice according to published data. The respective roles of guidelines and of other sources of information/education (meetings, journals) are still unclear [26]. Findings of this study can also be discussed regarding the study's design. Questionnaires in 2001 and 2008 were similar to the comparable basis; however, during the 7 years, observed changes could be because of the turnover of physicians within the institutions. In the same way, response rates in 2001 and 2008 were quite low, 40 and 54%, respectively. Answers were anonymous and responders of the two questionnaires were probably different. This methodological bias could explain a part of described changes.

Interest of evidence-based guidelines is unquestionable [29]. It permits to propose a synthesis realized by experts on a specific topic and is a part of the mission of the academic gastroenterologists. Practices are clearly difficult to modify and huge expenses for organization of consensus conferences in each country are still a matter of debate. The implementation of international guidelines originating from international boards of experts, then promoted in each country by national societies, could be an effective means to modify the physician's attitude.

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Conflicts of interest

There are no conflicts of interest.

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