

Referents for anti-infectious agents

Implication of antibiotic referents in complex bone and joint infections

Implication des référents en antibiothérapie dans les infections ostéoarticulaires complexes

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Abstract

One of the main objectives of antibiotic referents in French hospitals is to promote the nationwide antibiotic stewardship program. National guidelines for complex bone and joint infection management (CBI) issued in 2009, and expert and associated hospital centres were chosen. Our aim was to determine the role of antibiotic referents in CBI treatment modalities, in 2012.

Method. – A questionnaire was proposed to participants at the seventh national meeting of antibiotic referent in June 2012.

Results. – Ninety-seven questionnaires were completed. Antibiotic referents were mainly infectious diseases doctors working in public hospitals with more than 300 hundreds beds. Twenty-eight units dedicated to CBI were reported, as well as 35 multidisciplinary team meetings, 57% of which including physicians from both private and public hospitals. The 2009 national recommendations were the reference for 81% of responders, while referring to expert and associated centres was reported by 80%. Patient transfer to a reference center was rare, for both geographic reason and divergent medical and surgical habits. Most antibiotic referents suggested a 6-week course of antibiotic therapy and 12 months of follow-up. Twenty-two percent of the responders participated in morbidity and mortality audits.

Conclusion. – The 2009 national guidelines were rapidly taken into account. Their implementation led to more homogeneous clinical practices as reported by antibiotic referents. Reference centres are used for advice but patient transfer to these centres is still rare.

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Keywords: Complex bone and joint infections; Antibiotic referents; Antibiotic therapy; Orthopedic surgery

Résumé

La mise en œuvre des recommandations concernant le bon usage des antibiotiques est constitutive de la fonction des référents en antibiothérapie. La prise en charge des infections ostéoarticulaires complexes (IOAC) a fait l'objet d'un consensus en 2009 et des centres experts et associés ont été désignés. Notre objectif était de déterminer la place des référents dans les modalités de prise en charge des IOAC en 2012.

Méthode. – Nous avons proposé un questionnaire aux participants de la 7^e Journée des référents en antibiothérapie.

Résultats. – Quatre-vingt-dix-sept questionnaires étaient complétés. Les référents étaient essentiellement des médecins formés en infectiologie, œuvrant dans des hôpitaux publics de plus de 300 lits. L'existence d'une unité dédiée aux IOAC était rapportée 28 fois, celle d'une réunion de concertation pluridisciplinaire 35 fois, 57 % d'entre elles accueillant des acteurs d'établissements publics et privés. Les recommandations thérapeutiques de 2009 servaient de référence pour 81 % des déclarants, l'appel à un centre expert ou associé étant néanmoins rapporté dans 80 % des cas. Les transferts de patients vers un centre de référence restaient rares, pour des raisons géographiques et de culture médico-chirurgicale. La majorité des référents proposait une durée d'antibiothérapie de six semaines et une durée de suivi de 12 mois. Des revues de morbi-mortalité étaient réalisées par 22 % des déclarants.

Conclusion. – La prise en compte des recommandations françaises de 2009 est rapide. Leur mise en œuvre s'accompagne d'une homogénéisation des modalités thérapeutiques déclarées par les référents en antibiothérapie. Les centres de référence jouent un rôle de conseil mais les transferts de patients restent rares.

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Mots clés : Infections ostéoarticulaires complexes ; Référents en antibiothérapie ; Antibiotiques ; Orthopédie

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Bone and joint infections (BJI) are a daily concern for orthopedic surgery teams, including anesthesiologists, as well as infectious diseases teams. Their complexity (complex bone and joint infection, CBJI), defined by the presence of prosthetic material, and/or infectious agents resistant to usual anti-infectious drugs, and/or the loss of skin or muscular and vascular coverage, requires a multidisciplinary management, as recommended in the 2009 French consensus conference [1]. Implementing the 2009 recommendations and holding multidisciplinary team meetings (MTM) for the management of CBJI, should lead to more homogeneous clinical practices, from the clinical and microbiological diagnosis, to the antibiotic regimen and follow-up.

Obviously the antibiotic referent, physician appointed in each institution to implement antibiotic stewardship, should participate in these MTM dedicated to CBJI [2,3].

Nevertheless, some recommendations may be difficult to implement, because of spatiotemporal and technical constraints, and habits. In fact, some expert centres for the management of CBJI were designated in 2008, to work with associated centres and globally with public and private healthcare institutions managing patients having undergone orthopedic and trauma surgery in their area [4]. As far as we know, no assessment concerning these expert centres has ever been published.

Since 2006, the French Infectious Diseases Society (French acronym SPILF) has organized a yearly meeting for antibiotic referents, a day dedicated to exchanges and harmonization of practices for these healthcare professionals responsible for antibiotic stewardship. We asked these physicians to fill out a self-questionnaire, during the 7th meeting of antibiotic referents, to assess French practice in 2012, so as to better understand the implementation of the 2009 national recommendations for the management of CBJI, the role of antibiotic referents and of expert centres.

1. Method

The questionnaire was handed out at the beginning of the infectious diseases specialists meeting, on the first morning of the 13th National Congress of Infectiology in Tours in June 2012. Each participant was given an anonymous questionnaire including 20 multiple or single choice questions aiming firstly at describing the referent's site of practice, and the context of CBJI management. Secondly, the questions concerned the medical and surgical management of patients presenting with CBJI, especially regarding MTM and of use of expert centres. The data was collected with the Statview[®] software, the associations in qualitative data were evaluated with the χ^2 test. The comparison of averages was made with Mann and Whitney's non-parametric test. Differences were considered significant when the level of significance was inferior or equal to 5%.

2. Results

The questionnaires were filled out by 97 of the 158 participants at the 7th meeting of antibiotic referents (61%). Out of these 97, 60 referents were infectious disease specialists, 24

internal medicine specialists or rheumatologists, seven anesthesiologists, four microbiologists, and two pharmacists.

Most of these referents worked in public institutions: (47 out of the 65 documented answers concerning the type of institution (72%)), 17 worked in private institution (26%), and one referent worked in both types of institution. Most of these hospitals had 300 patient beds or more (65/94, 69%), 16 referents worked in hospitals of at least 100 beds. Six referents worked in a reference center, and 27 in an associated center; 63/96 stated working in an "other" type of institution (66%).

There was a statistical relationship between the referent's training in infectious diseases and the hospital size. Forty-six of the 65 infectious diseases specialists stated working in hospitals with 300 beds and more (71%, $P=0.019$).

A unit dedicated to the management of BJI was mentioned 28 times; it was located in the surgical ward in 19/28 cases (68%). In 10 cases, the surgeon managed of this specific unit, in 10 cases it was the infectious disease specialist or the referent in antibiotherapy, and in eight cases physicians and surgeons shared the unit management.

An MTM was set up for the management of CBJI in 35/97 institutions (36%); these MTM included three to five members in 28 cases (80%). These MTM grouped healthcare professionals from both public and private institutions 20 cases (57%), and exclusively from public institutions in 12 cases (34%). These MTM were held most often monthly (15 cases, 42%) or weekly in 13 cases (36%); they could be held twice a month (4 cases) or when needed (4 cases). Minutes of the MTM were written in 28/35 cases (80%), they were also mentioned in the patient's medical file in 32 cases (91%).

Consulting a reference center during these MTM was reported in 66/82 questionnaires (80%).

Concerning the therapeutic regimen, most of the responders (72/88, 81%) mentioned complying with the 2009 recommendations of the French Infectious Diseases Society (French acronym SPILF). Eight referents reported using an internal protocol, and three centres did not have any local guidelines. Furthermore, the referents mentioned 21 times the need to adapt the antibiotherapy case by case (24%). The identification of multi-resistant bacteria (MRB) was the main reason for consulting the reference centres; it was mentioned 25 times (26%).

The role of the antibiotic referent in the management of antibiotherapy for CBJI as well as the main reasons mentioned for not transferring patients to a reference center or an associated center are listed in Table 1. The infectious disease specialists and/or the antibiotic referents usually initiated the antibiotherapy regimens. Distance from of the reference center was the first reason for not transferring patients presenting with CBJI to a reference center or an associated center, followed by the surgical team's reluctance to transfer patients.

The reported duration of antibiotherapy was six weeks in 45/85 cases (53%), eight weeks in 13 cases, and 12 weeks in 27 cases. The reported duration of medical follow-up after antibiotherapy was six months in 15/80 cases (17%), 12 months in 44 cases (55%), and 24 months in 21 cases.

Finally, the management of CBJI was reviewed in morbidity and mortality audits in 18/89 cases (22%), the referents

Table 1

Specialists initiating the therapy regimen and reasons for not transferring patients presenting with CBJI to reference centers.

Responsables de la mise en œuvre des modalités thérapeutiques et raisons de l'absence de transfert des patients présentant une infection ostéoarticulaire complexe vers un centre de référence ou un centre associé.

	Number
<i>Specialist initiating the therapy regimen (several possible answers)</i>	
Infectious disease specialist	62
Antibiotic referent	43
Surgeon	16
Anesthesiologist	14
Internal medicine physician or rheumatologist	7
<i>Reason for not transferring the patient (several possible answers)</i>	
Distance from the expert center	37
Surgeon's reluctance	25
Not used to transferring patients	24
Sufficient local competence	22
Medical frustration	3

managing these patients stated they were informed of litigations related to these CBJI in 32/70 cases (46%).

3. Discussion

More than 60% of participants at the 7th meeting of antibiotic referents filled out the questionnaire. Only one question, concerning the number of beds available in the unit dedicated to CBJI, did not have a satisfactory answer rate (3/97). More than 70/97 answers (72%) were collected for all the others questions.

Antibiotic referents involved in CBJI management are mainly infectious disease specialists. Their great number, compared to pharmacists, microbiologists, or hygienists, even though greatly concerned by the Antibiotic stewardship policy, might be explained by the clinical difficulties to prescribe antibiotic combinations, often parenteral and prolonged, known to be the cause of adverse effects [3]. We published a study in 2008, carried out in two hospital centres, in which 21% of patients receiving prolonged parenteral antibiotherapy for CBJI had presented with adverse effects, related to the mode of administration and/or the toxicity of prescribed agents [5]. This high morbidity associated with CBJI may also explain the predominance of public practice physicians in the management of these patients (72% of responders) in hospitals the size of which allows access to optimized medical and surgical technology. Thus our results show that infectious disease specialists were more often in hospitals with more than 300 beds, accordingly with expected needs.

The presence of a dedicated unit was reported by more than a third of participants, highlighting the incidence of CBJI and the complexity of required care. The MTM dedicated to CBJI was primarily organized in public healthcare institutions but included more often physicians practicing in private institutions (85%). The frequency of these MTM was variable, reflecting the availability of the various participants. The data suggests that holding an MTM for CBJI was too rare, when considering the need, and that the meeting results were often incompletely filled out in the patient's medical files. The contribution of an MTM dedicated to CBJI for the antibiotic stewardship, implemented by

surgeons and the antibiotic specialist, was suggested in a recently published study [6]. Improving practices, as well as using a reference center or an associated center, are required because of the medico-legal impact of these healthcare related infections [7].

The therapeutic regimens are clearly compliant with the 2009 French recommendations [1], overwhelmingly approved in more than 80% of cases. Nevertheless the frequent case-by-case adaptation proves the difficulty to issue guidelines taking into account the heterogeneity of these CBJI, with different causative germs and because of comorbidities. Thus, CBJI due to MRB was the first reason for contacting a reference center.

Nevertheless, even if telephone calls to expert centres or associated centres appeared to be common practice, transferring patients was more rare. Distance with the reference center was the first reason for not transferring a patient. This is not surprising since CBJI are mostly observed in elderly patients who need close family support, in families with daily constraints due to the disease of a relative with altered functional capacities.

The medical and surgical teams' lack of experience in multidisciplinary practice was the second factor for not transferring patients (Table 1). It is likely that the scarcity of evaluations for the medical and surgical management of CBJI may let some believe that differences in practice have little impact on the morbidity and mortality related to CBJI. Hence, morbidity and mortality audits are rarely implemented (22% of responders) whereas medical and legal information only rarely reaches referents (46%). This is why the usefulness of referring patients presenting with CBJI to a reference center is naturally badly understood.

The most frequently mentioned course of antibiotherapy was 6 weeks (53% of cases), and were two times more frequent than a course of 12 weeks. This is surprising, given the relative scarcity of studies reporting the possibility to significantly decrease the duration of antibiotherapy, and the 2009 recommendations mentioning treating patients from 6 to 12 weeks [1,8,9].

4. Conclusion

The yearly day for antibiotic referents is a good time to assess practices of healthcare professionals working for the antibiotic stewardship. Our study results suggest that practices are becoming more homogeneous concerning the management of CBJI. This homogeneity will allow multicentric assessment of recommended actions. This evaluation will in turn allow making the necessary adaptation of the recommendations and contributing in fine to decrease the morbidity and mortality related to CBJI.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

References

- [1] Recommandations de pratique clinique infections ostéoarticulaires sur matériel (prothèse, implant, ostéosynthèse). Société de pathologie infectieuse de langue française (SPILF) 2009.

- [2] Société de pathologie infectieuse de langue française. Comment améliorer la qualité de l'antibiothérapie dans les établissements de soins ? *Med Mal Infect* 2002;32:320–8.
- [3] Amadeo B, Dumartin C, Parneix P, Fourier-Réglat A, Rogues AM. Relationship between antibiotic consumption and antibiotic policy: an adjusted analysis in the French healthcare system. *J Antimicrob Chemother* 2011;66:434–42.
- [4] Senneville E, Migaud H. CRIOAC: trois ans déjà ! *La Lettre de l'Infectiologue* 2012;27:98–9.
- [5] Pulcini C, Couadau T, Bernard E, et al. Adverse effects of parenteral antimicrobial therapy for chronic bone infections. *Eur J Clin Microbiol Infect Dis* 2008;27:1227–32.
- [6] Bauer S, Bouldouyre MA, Oufella A, Palmari P, Bakir R, Fabreguettes A et al. Impact of a multidisciplinary staff meeting on the quality of antibiotic therapy prescription for bone and joint infections in orthopedic surgery. 2012;42:603–7.
- [7] Fabre H. Un professionnel, un établissement de santé peuvent-ils se défendre face à une mise en cause pour infection nosocomiale ? Où est l'équité dans les textes ? *Med Droit* 2005;55–60.
- [8] Farhad R, Roger PM, Albert C, Pelligri C, Touati C, Dellamonica C, et al. Six weeks antibiotic therapy for all bone infections: results of a cohort study. *Eur J Clin Microbiol Infect Dis* 2010;29:217–22.
- [9] Bernard L, Legout L, Zürcher-Pfund L, et al. Six weeks of antibiotic treatment is sufficient following surgery for septic arthroplasty. *J Infect* 2010;61:125–32.