

Original article

Three years of antibiotic consumption evaluation in French nursing homes

Trois ans de consommations d'antibiotiques en établissements d'hébergement pour personnes âgées dépendantes

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Abstract

Objectives. – We had for aim to assess antibiotic consumption and to better understand their use in nursing homes so as to target messages on relevant practice procedures sent to prescribers.

Design. – The MedQual network asked nursing homes with in-house pharmacies to participate in a retrospective collection of yearly antibiotic consumption data with an Excel[®] spread sheet according to the Health Ministry recommendations.

Results. – Fifty-two nursing homes participated in 2011, 2012, and 74 in 2013, accounting for 10% of the Pays de la Loire region's nursing homes and 15% of beds. The medians of total antibiotic consumption in daily-defined dose for 1000 patient-days were respectively 39 (32.4–49.0), 39.3 (34.4–52.9), and 44.8 (33.6–55.4). There was no significant difference between 2011 and 2013. Penicillins (J01C) were the most commonly used class with a median of 25.7 [IQ 18.8; 33.8] in 2011 and 30.4 [IQ 23.6; 41.3] in 2013. Quinolones (J01M) were the second most commonly used class with a median of 4.6 [IQ 2.9; 5.9] in 2011 and 3.8 [IQ 2.3; 6.5] in 2013, followed by the other beta-lactams (J01D) with a median of 2.5 [IQ 1.7; 4.5] in 2011 and 2.8 [IQ 1.7; 3.8] in 2013.

Conclusion. – The monitoring of antibiotic consumption in nursing homes in the Pays de la Loire Region since 2011 has allowed identifying inappropriate use and helped improve practices. No increase of overall consumption was observed in nursing homes but the distribution according to antibiotic class changed. The current objective is to extend this monitoring and to send personalized messages to prescribers.

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Keywords: Antibiotic; Nursing home; Penicillin

Résumé

Objectifs. – Suivre la consommation des antibiotiques afin de mieux en connaître l'utilisation dans les établissements d'hébergement pour personnes âgées dépendantes (EHPAD) et de cibler les messages à adresser aux prescripteurs.

Méthodes. – Depuis 2011, MedQual propose aux EHPAD dont l'approvisionnement est assuré par une pharmacie à usage intérieur, de participer à un recueil rétrospectif annuel des consommations antibiotiques à l'aide d'un tableau Excel[®] adapté à la région, selon les recommandations du ministère de la Santé.

Résultats. – Cinquante-deux EHPAD en 2011 et 2012, et 74 en 2013, représentant environ 10 % des établissements de la région et 15 % des lits, ont participé au recueil des données de consommation d'antibiotiques. Les médianes de la consommation globale d'antibiotiques sur ces 3 ans, exprimée en doses définies journalières pour 1000 journées d'hospitalisation, sont respectivement de 39 (32,4–49,0), 39,3 (34,4–52,9) et 44,8 (33,6–55,4). Il n'y pas de différence significative entre 2011 et 2013. Les pénicillines (J01C) restent la classe la plus consommée avec une médiane de 25,7 [IQ 18,8 ; 33,8] en 2011 à 30,4 [IQ 23,6 ; 41,3] en 2013. Les quinolones (J01M) représentent la deuxième classe avec une médiane de 4,6 [IQ 2,9 ; 5,9] en 2011 et 3,8 [IQ 2,3 ; 6,5] en 2013 devant les autres bêta-lactamines (J01D) : 2,5 [IQ 1,7 ; 4,5] en 2011 et 2,8 [IQ 1,7 ; 3,8] en 2013.

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Conclusion. – Le suivi de la consommation d’antibiotiques en EHPAD permet de repérer les situations d’usage inapproprié et d’accompagner les mesures d’amélioration. Il n’a pas été observé d’augmentation de la consommation totale mais la répartition entre les classes d’antibiotiques a évolué. L’objectif à terme est d’étendre ce dispositif et de véhiculer des messages individualisés aux prescripteurs.

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Mots clés : Antibiotiques ; EHPAD ; Pénicillines

1. Introduction

The management of dependent elderly patients has become a major public health issue due to the aging of the French population. France remains one of the countries with the greatest consumption of antibiotics in community and healthcare facilities [1]. The French population is aging and therefore requirements for accommodation are increasing [2]. Age-related frailty and living in an institution are risk factors for infection [3] and account for the exposure of elderly patients to antibiotics. The systematic monitoring of antibiotic consumption is neither proposed nor performed in nursing homes (NHs) in France, contrary to what is proposed in healthcare institutions by the ATB-RAISIN (French antibiotic network) [4]. Only prevalence studies of antibiotic consumption on a given day were conducted at a national and regional level in France, with results ranging from 3.9 to 6% [5–12]. MedQual, the resource center for antibiotic use, has extended its actions to NHs since 2011, to promote the regional policy of antibiotic stewardship. The objective of our study was to monitor the consumption of antibiotics in NHs longitudinally, to assess the trends and document the most frequently prescribed agents.

2. Materials and methods

The yearly retrospective collection of antibiotic consumption data has been performed since 2011 in NHs of the Pays de la Loire region supplied by an in-house pharmacy (IHP), because inventory management and/or prescription and pharmaceutical analysis software facilitate access to data. The antibiotic consumption in day-care institutions and sheltered housing is excluded from the collection. NHs participate on a voluntary basis. Data were collected from Excel® spreadsheets according to the Ministry of Health recommendations, adapted to a yearly retrospective collection in the region [13] for 2011 and 2012. In 2013, the e-tool ConsoRes® designed by the regional coordination center for the control of nosocomial infections in Eastern France (CClin East), was implemented by MedQual in Pays de la Loire healthcare institutions. This allows monitoring J01 class systemic antibiotics of the Anatomical Therapeutic Chemical classification system (ATC). Seven antibiotics administered orally were more closely monitored: amoxicillin, amoxicillin/clavulanic acid, ofloxacin, norfloxacin, sulfamethoxazole/trimethoprim, nitrofurantoin, and third-generation cephalosporins (C3G). The NHs are classified according to their administrative subdivision and category defined by the number of beds: less than 80 beds, from

81 to 160 beds, and 161 beds and more. The medians were compared with a Mann-Whitney test (nonparametric test) and Student’s *t* test (nonparametric test) ($P < 0.05$).

3. Results

3.1. Representativeness

Fifty-two NHs, supplied by an IHP, participated in the collection of antibiotic consumption data in 2011 and 2012, and 74 in 2013. Table 1 is a list of NHs for which consumption data were analyzed, approximately 10% of NHs in the Pays de la Loire region and 12% of total number of beds.

3.2. Antibiotic consumption

The median regional consumption of antibiotics, expressed in DDD/1000PD, was respectively 39, 39.3, and 44.8 from 2011 to 2013. No significant difference was observed between 2011 and 2013 ($P > 0.05$). The first 3 classes (median expressed in DDD/1000PD) of the most consumed antibiotics were penicillins (J01C) [25.7 (2011), 28.9 (2012) and 30.4 (2013)], quinolones (J01M) [4.7 (2011), 4 (2012), 3.8 (2013)] DDD/1000PD, and class of macrolides and related (J01F) [3.2 (2011), 2.6 (2012), 2.7 (2013)]. A significant difference was observed only for the class of penicillins (Table 2) with a decrease of 15.4% between 2011 and 2013. A significant increase in consumption was noted for amoxicillin/clavulanic acid *per os* ($P < 0.05$) among the 7 closely monitored antibiotics (Table 3) considered as important antibiotics concerning the emergence of resistance (amoxicillin/clavulanic acid, third-generation cephalosporins, and fluoroquinolones). Comparisons between region administrative sub-divisions were made (Table 4). There was no difference in antibiotic consumption among the Loire Atlantique (44), Maine et Loire (49), Mayenne (53), Sarthe (72), and Vendée (85) sub-divisions for each year. The antibiotic consumption increased in the sub-divisions, ($P > 0.05$) except for Vendée. NHs consumed less between 2011 and 2013, but not significantly so ($P = 0.36$). We also analyzed the data according to nursing homes’ number of beds (Table 5). No significant difference was observed.

4. Discussion

The management of dependent elderly patients has become a major public health issue due to the aging French population. A total of 1.17 million of elderly were dependent (7.8% of

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