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Abstract

Background: Healthcare-associated infections (HCAIs) occurring outside of health facilities are underestimated because there are a lack of structured preventive organization and absence of epidemiological surveillance. HCAI prevalence is likely to grow with the increase in patient care outside of health institutions.

Aims: To set up a situational analysis of good hygiene practices among private general practitioners (GPs) to better organize HCAI prevention in this sector.

Methods: A descriptive cross-sectional study was conducted between November 2017 and March 2018, using a self-administered questionnaire among all GPs in Sousse City, Tunisia.

Results: Participation rate was 93.1%. There was a predominance of male GPs (63%), with a sex ratio of 1.7:1. Up-to-date vaccination status was reported by 82 (75.9%) of GPs. Fifty-six (51.3%) GPs used hydroalcoholic solutions, 13 (12.1%) adopted autoclaving, and 106 (98.1%) wore gloves during invasive care. Blood exposure accidents (BEAs) were reported by 38 (35.2%; declared in 26.3% of cases) and were more prevalent in the group aged > 50 years who used significantly more reusable equipment. BEAs were primarily due to needle-stick injuries (86.8%).

Conclusion: We identified the priority axes to be considered in organizing HCAI prevention in the private sector, which allows guidance of GPs, avoiding their isolation and compensating for their lack of training and information. This requires willingness and a culture of improving the quality and safety of care in this sector. Committed involvement of several stakeholders at different levels of decision-making in health care is needed.

Keywords: good hygiene practices, healthcare-associated infections, general practice, liberal sector, Tunisia

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Introduction

Prevention of healthcare-associated infections (HCAIs) aims to ensure the safety of both patients and healthcare workers (HCWs). The World Health Organization (WHO) reports that, at any given time, > 1.4 million people worldwide have HCAIs (1–3). In Tunisia, the latest national HCAI prevalence survey conducted in 2012 reported a prevalence rate of 6.66%, which is 1 in 15 patients affected, compared to 6.9% according to the first national HCAI prevalence survey in 2005 (4).

In healthcare facilities, infection risk management is part of a programme to prevent HCAIs (5). However, this risk is not limited to health facilities (state or private), but extends to city practices, although its quantitative importance is more difficult to assess. Private practitioners provide care that necessarily generates risks, particularly infectious risks (6). HCAIs contracted in the private sector are underestimated due to the absence of a suitable epidemiological surveillance system with no structured preventive organization. HCAIs are likely to increase with the increase in care of vulnerable patients outside healthcare institutions. In this context, the application of good hygiene practices (GHPs) is universally recognized as the best guarantee of effective

prevention of HCAIs (7,8).

Academic medical training courses, combined with hospital internships, should theoretically contribute to the establishment of quality care and safety culture, with appropriate risk management in parallel with continuing training for physicians. This could include postgraduate training in hygiene or participation in scientific events addressing management of HCAI risk (9–11).

In Tunisia in the private sector, unlike in public institutions, no data are available for quantifying the infectious risk associated with care and assessing application of GHP. Thus, the objective of the present study was to draw up an inventory of GHP among private general practitioners (GPs) to propose measures to improve the prevention of HCAIs in this sector. We followed the example of countries with structured and organized control and prevention programmes in the private sector, such as professional practice assessments and oversight by health authorities, as well as continuing professional development (CPD) and certification of health professionals.

Methods

We conducted a cross-sectional descriptive study from November 2017 to March 2018 among all GPs in the private sector in Sousse City, Sousse Governorate, Tunisia. The Governorate had 674 818 inhabitants, according to the general census of the Tunisian population of 2014, with 213 private GPs, and Sousse City had 349 392 inhabitants, with 116 private GPs (12). The list of GPs and their addresses were provided by the Regional Council of the Tunisian Medical Association. They were contacted individually and succinctly informed of the study's progress and objectives.

The questionnaire comprised: (1) general characteristics of the respondents (age, sex, year of graduation, training, year of installation in the private sector, vaccination status etc.); (2) characteristics of hygiene products and equipment used in medical practice; (3) caregivers' practices concerning GHP and type of blood exposure accidents (BEAs); (4) organization for best management of infectious risk in medical practice; and (5) proposals from respondents relating to actions judged priorities for the best observance of GHPs. The questionnaire was developed by hospital hygienists and physicians specifically for the purpose of our study and was validated by senior medical experts in hygiene and quality of care. The questionnaire was designed to apply only to GPs in the private sector and was tested among 10 private GPs in another governorate near Sousse. It was delivered directly and an appointment was made to recover it, and several visits were sometimes essential. Data entry and analysis were carried out using SPSS 20.0 software.

For each estimate, a confidence interval was calculated according to the classical formula. When the conditions of application were not met, the Wilson continuity correction procedure was used (13). The descriptive part of the results described the quantitative variables as mean (standard deviation) and the qualitative variables by their relative and absolute frequencies. We used Pearson's χ2 test (with a significance level P 50 years) and the occurrence of BEAs. We used the c2 test with Yates correction or Fisher's exact test if the conditions of application were not met.

Results

A total of 108 of 116 GPs responded to our survey (participation rate 93.1%). There was a male predominance (63%) with a sex ratio of 1.7:1. Participants had average seniority of service of 14.5 (2.1) years (range 1–45 years). Sixty-seven (62.1%) respondents were under the age of 50 years. An average interval of 4 years separated final medical study and office setup.

The medical practices of the GPs as well as the characteristics of BEAs are detailed in Table 1 . BEAs occurred in 33 (86.8%) GPs during stitching and 29 (76.3%) during antiseptic application.

The obstacles perceived by GPs to hinder application of GHPs, as well as the training associated with their expectations and proposals are reported in Table 2 . Seventy-nine (73.1%) GPs perceived that basic training was adequate for the application of GHPs. High product cost was perceived as a barrier to the application of GHP by 64 (59.4%) GPs. Eighty-five (78.7%) GPs expressed a wish for a change in the training methods for the application of GHPs. Sixty-one (73.5%) GPs identified waste management as a barrier to the application of GHP.

There was a significant difference in favour of respondents aged ≤ 50 years with regard to up-to-date immunization status, waste sorting by the caregivers themselves, use of sharp-edged-object containers, and desire to receive GHP training (Table 3). Respondents aged > 50 years had significantly more BEAs.

GPs who carried out less self-sorting of waste, used fewer sharp-edged-object containers, and adhered less to GHP training had significantly more BEAs (Table 4).

Discussion

Our study is the first step in taking stock of the current state of affairs with regard to GHP in the private sector in Tunisia, and serves as a precursor to a strategic plan for improving the quality and safety of ambulatory care. The study helped to raise awareness among GPs and remind them of the importance of GHP, and involved caregivers in devising a strategy to address the risk of infection in the private sector.

An average interval of 4 years separated the end of medical studies and the year of office setup. Guily reported an interval of 5 years and insisted that the majority of postgraduate training should be carried out between completion of basic medical studies and internship (15).

The efficacy and good tolerance of hepatitis B vaccination among HCWs has been widely reported (14–18). In our study, 75.9% of doctors declared having a current HBV vaccination status, which is similar to previous studies (16,17). Vaccination is only 1 part of infection control programmes for HCWs, and Abiteboul reported that vaccination should not substitute for collective and individual protection measures. Immunization of HCWs has a double aim of protecting HCWs and their patients from infection. In France, some vaccinations are mandatory in HCWs, such as hepatitis B vaccination (8).

In our study, all practices were equipped with a waiting room and an office room. We chose to address this concept to emphasize the importance of the principle of sectorization. Less than half of the respondents (49, 45.4%) stated that they did not have a separate care room, which implies that patients were examined and care was provided in the same consultation room. The inert environment of the office can be contaminated by the mixing of people, frequent contact of surfaces with the hands of the consultants but also patient morbidity, such as communicable diseases, and the added risk of patient waiting time. This finding is likely to represent a lack of respect for the recommendations relating to the sectorization of care rooms for the prevention of HCAIs (3,4,14,15,19).

It is recommended that practices should be equipped with at least 2 handwashing stations (treatment room and sanitation area) (20). In our study, 51.9% of physicians reported meeting these conditions, which is fewer than previously reported (21,22). Hand hygiene is the mainstay of hygiene rules; a gesture that is simple and easy to observe and whose effectiveness has been widely proven in reducing HCAIs (3,8,18,22,23). Our study showed that 65.7% of doctors practiced hand hygiene between seeing patients. These results agree with previous studies emphasizing the importance of hand hygiene (6,24,26). The method used is chosen according

to the specificity of the care and the nature of the performed procedures. In ambulatory care, rubbing hands with hydroalcoholic solution seems to be the method of choice and of proven effectiveness (1,24,25). We reported the use of hydroalcoholic solution for hand hygiene by 53.7% of the respondents, which is low compared with other studies (20, 21). In addition, the adoption of hydroalcoholic solutions offers the advantages of improved compliance with hand hygiene and product tolerance, associated with financial gain and environmental friendliness (24).

There are improvements to be made with regard to the abandonment of multiple-use laundry as a means of hand drying (19,21,25). For the same quality and safety of care, it is recommended to opt for the use of single-use equipment; however, multiple-use equipment is common (27). We found that 61.1% of our respondents had used reusable equipment, which is comparable with previous studies (15,19,20,28).

In our study, 38.9% of the practices were equipped with a sterilization room, which is much less than 63% reported by Varnoux (19). We found that 12.1% of users of reusable equipment used autoclaving for sterilization. There are still reports of frequent adoption of dry heat sterilization (20,21,25) despite recommendations to abandon it (18). Thus, the adoption of autoclaving still needs to be improved. The limits to its use are financial constraints, lack of knowledge and low perceptions of its effectiveness. The means to overcome these constraints are improved information and amortization of economic costs (e.g., acquisition of a common autoclave) (24). Among our respondents, 57.4% reported regular cleaning of their equipment (stethoscopes/tensiometers), although this is unsatisfactory compared with previous studies (15,25). The contribution of equipment maintenance to reducing cross-transmission is widely described in the literature (29–31). In this regard, Smith et al. (32) evaluated the bacterial and fungal colonization of 200 stethoscopes/tensiometers and showed that 80% were colonized. Furthermore, doctors' stethoscopes were significantly more contaminated than those of other HCWs. Parmar et al. showed that daily disinfection with alcohol significantly reduced cross-transmission from stethoscopes (29).

We found that almost all (98.1%) practitioners reported wearing gloves to perform invasive procedures, which is in line with results reported in the literature (14,21,25). Mouzamil reported 40 cases of arthritis following infiltrations performed on an outpatient basis between 2006 and 2009, despite practitioners wearing gloves (25).

The WHO has reported that, in 22 developing countries, 18–64% of health facilities do not properly dispose of healthcare waste, in addition to the globally inappropriate disposal of needles and syringes from 12 billion injections/year (8). Tunisia has strict regulations for

healthcare waste. Nevertheless, this problem is imminent, due to increased production, insufficient awareness of the harmfulness and risks associated with healthcare waste, and lack of knowledge of existing regulations (33). We found that 29.6% of respondents were sorting out healthcare waste on their own, which is in line with Guignon (31) but different from Wagenheim et al. (14), which can be explained by the workload as well as lack of knowledge and low perception of risks. In our study, 9.2% of the respondents reported elimination of waste from care activities that pose a risk of infection by a subcontracted service provider. This differs from other studies (15,20,21,31,34) and can be explained by the lack of information and accountability regarding the use of services by subcontracted providers, and by the difficulty in accessing them.

BEAs are a measurable and avoidable occupational risk. The nature and extent of the incurred risks vary according to the care activity (8). Epidemiological data for healthcare facilities are probably underestimated and under-reported (24). Outside healthcare facilities, data are scarce. An American study (548 home care providers and 33 606 visits) reported 3.6 BEA/1000 procedure-visits (34). In the United Kingdom of Great Britain and Northern Ireland, BEAs involved 7% of community HCWs (35). In our study, 35.2% of respondents reported being BEA victims, which is similar to previous studies (15,19). Comparison of physicians in terms of the frequency of BEAs showed a significant difference in favour of younger practitioners. This can be explained by a better perception of risk. Regarding the circumstances of BEA, our respondents attributed them mainly to needle-stick injuries, which is similar to previous studies (14,28). Among respondents who were victims of BEAs, 42.1% reported bleeding, which indicates a lack of knowledge, and only 26.3% declared their BEA. Although these results are unsatisfactory, they are still better than those of Wagenheim et al., who also specified that the lack of declaration related to underestimation of the risk, the time involved and the complexities of the procedures (14).

Academic medical training in GHP is still insufficient and must be reinforced according to the mode of practice and the nature of the care activity, with adaptation of skills to the requirements of the job profile. In Tunisia, continuing medical training has little interest in the specificities of the private sector and in improving the quality and safety of care in this domain. Respondents' perceptions of the adequacy of their training in BEAs and the application of GHPs differed from those reported previously, who perceived it as adequate (14).

Regarding the obstacles to the application of GHPs, our respondents reported the high cost, which differs from Guily, who reported lack of training (15). We note the role of professional associations, learned societies and trade unions in the organization of compensation and the loss of income during continuing education, along with the contributions of pharmaceutical companies.

In Tunisia, there is no structured and formal quality control system for health care. In fact, there are no regulations governing the acquisition of equipment to support this important part of medical practice. In addition, no companies that subcontract complementary healthcare services (hospital waste treatment or vector control companies) do not enter into agreements with medical practices, but rather use their services for healthcare structures for reasons of financial profitability, among others.

The main limitation of our study was the choice of study series, which may have incurred selection bias. The degree of representativeness hinders the extrapolation of our findings to all GPs in Sousse Governorate or at national level. Qualitative evaluation using a self-administered questionnaire may have had the problem of reporting bias in the physicians' responses (noncompliance for reasons of mistrust or reluctance related to their medical practice considering GHPs). Constraints in the field have been encountered, such as the scattered distribution of physicians' offices or group practices and the lack of interest and motivation of some, due to ignorance, misunderstanding or negligence of the subject matter. Moreover, several visits were sometimes necessary to retrieve completed questionnaires or the requirement to wait until the end of the medical consultation to be able to meet the doctor.

Conclusion

We revealed alarming results relating to some areas of GHP in private practice, especially concerning hand hygiene, use of reusable equipment, equipment sterilization and cleaning procedures, management of HCWs, and maintenance of healthcare equipment. Thus, knowledge of the specificities of professional practices and the organization of care in medical practices, with identification of the obstacles hindering compliance with the application of GHPs, makes it possible to adapt the precautions to be taken and organize structured control and prevention. In addition, it is essential to commit to the observance of a minimum package of GHP recommendations that can be adopted as a basis for establishing a threshold of requirements for office hygiene, to be able to practice in the private sector. This requires willingness and a culture of improving the quality and safety of care in this domain and the concrete involvement of several actors at different levels. We recommend conducting a larger study covering different Tunisian Governorates in order to have a more representative observations at a national level to support planning of priority and appropriate actions to be implemented in the private sector for the best quality and safety of care.

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Application des bonnes pratiques d'hygiène dans le secteur libéral en Tunisie

Résumé

Contexte : Les infections associées aux soins (IAS) survenant en dehors des établissements de santé sont sous-estimées en raison de l'absence d'organisation structurée de la prévention et de l'inexistence de la surveillance épidémiologique. Leur prévalence est susceptible d'augmenter avec l'accroissement des prises en charge des patients à l'extérieur des institutions sanitaires.

Objectifs : Dresser un état des lieux des bonnes pratiques d'hygiène auprès des omnipraticiens libéraux pour mieux organiser la prévention des IAS dans ce secteur.

Méthodes : Il s'agit d'une étude descriptive transversale, menée en 2017 (novembre)-2018 (mars), à l'aide d'un questionnaire auto-administré auprès de tous les omnipraticiens du gouvernorat de Sousse-Ville (Tunisie).

Résultats : Le taux de participation était de 93,1 %. Une prédominance des omnipraticiens de sexe masculin (63 %) a été notée (sex-ratio=1,7 : 1). Un statut vaccinal à jour a été rapporté par 82 omnipraticiens (75,9 %). Cinquante-six omnipraticiens 53,7 % optaient pour l'usage des solutions hydro-alcooliques, 13 (12,1 %) avaient adopté l'autoclavage et 106 (98,1 %) déclaraient porter des gants d'omnipraticiens lors des soins invasifs ; 38 (35,2 %) notifiaient être victimes d'accidents exposant au sang (AES) (déclarés dans 26,3 % des cas) ; ce type d'accident était plus prévalent dans le groupe des plus de 50 ans, lequel semble utiliser statistiquement davantage le matériel réutilisable. Les AES sont dus surtout aux piqûres (86,8 %).

Conclusion : Nous avons identifié les axes prioritaires à considérer en organisant la prévention des IAS en secteur libéral, ce qui permet d'orienter les omnipraticiens, d'éviter leur isolement et de combler les manques de formation et d'information. Ceci nécessite une volonté et une culture pour l'amélioration de la qualité et de sécurité des soins dans ce secteur et l'implication engageante et concrète de plusieurs intervenants à différents niveaux de décisions en santé.

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