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"Beyond the Guidelines" – Deviations in Adherence to Infection Control Measures in Tyrolean hospitals, Austria

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Highlights

- Infection control measures in Tyrolean hospitals vary according to discipline

- Best congruence to CDC-recommendations was observed in Infection Control teams

- Clinical disciplines showed only fair congruence to CDC-recommendations

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2

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3

Abstract

Background

Hospital-acquired infections (HAI) represent increasing problems in health-care facilities worldwide. Adequate infection control measures are key elements in preventing those infections. Expert societies have published recommendations that help to reduce HAI.

Methods

In November 2019, a questionnaire-based point-prevalence survey, eliciting the adherence of 14 Tyrolean hospitals to the recommendations of the Centers of Disease Control and Prevention (CDC) was performed. Additionally, standard infection control measures performed by different medical (clinical and infection control specialists) disciplines as well as the performed infection control measures of nurses and physicians were compared.

Results

The survey revealed varying adherence to CDC-recommendations of different medical disciplines, with highest congruence by the infection control specialists and lower congruencies by all surveyed clinical disciplines. Concordance rate between nurses and physicians was high.

Discussion

Explanations for the varying congruencies of clinical disciplines on the one hand and the infection control specialists on the other hand may be versatile. Possible lacks of knowledge about the required hygiene measures should be taken into account.

Conclusion

The present survey showed moderate adherence of Tyrolean hospitals to the recommendations provided by CDC, however with noticeable differences between different medical disciplines. Nurses and doctors in most cases reported identically.

Keywords: Infection Control Measures, Tyrol, Austria, Point-prevalence survey

Background

Hospital-acquired infections (HAI) play a crucial role in clinical medicine. Hospital-acquired urinary tract infections (haUTI), hospital-acquired surgical site infections (haSSI), hospital-acquired, ventilator-associated respiratory tract infections (havRTI) as well as infections related to intravenous catheters (ICAI), beside others, play a very important role in clinical routine, not only in intensive care units (ICU), but also in regular wards[1].

A point prevalence survey conducted in 2011 and 2012 by the European Centre of Disease Control and Prevention (ECDC) identified haUTI, haSSI and havRTI as the most frequent HAI in European hospitals, including Austria[2]. Prevention of these and other infections requires distinct infection control measures. Standard infection control measures involving hand hygiene and proper disinfection procedures undoubtedly play a very important role as well as isolation precautions, including the use of adequate Personal Protective Equipment (PPE)[3-5]. Another important factor in prevention of HAI is antiseptic treatment of patients. This can refer either to patients colonized with multidrug resistant bacteria or to all patients in a defined setting (ICU, e.g.). For instance, there are publications promoting the positive effects of chlorhexidine-bathing, as well as publications that appraise the broad use of chlorhexidine more cautiously[6-7]. Infection prevention bundles consist of many procedures, which have been shown to help reducing HAI and have been disseminated as recommendations of different expert societies as guidelines. Since there are no data available about the factual overall adherence of the medical staff in Tyrolean and Austrian hospitals to published (or established) infection control measures, two aims were defined for the present point-prevalence study: I) Adherence of the staff in the participating hospitals to the guidelines provided by the Centers of Disease Control and Prevention (CDC), which belong to the most important recommendations worldwide and II) Differences between medical disciplines on the one hand and between nurses and physicians on the other hand.

Materials and methods

The present questionnaire-based study, performed in November 2019, was conducted as a point-prevalence study. To cover a broad range of different topics related to infection control, a detailed questionnaire encompassing 80 questions has been created. Questions addressed the following fields of infection control: hand hygiene and common hygiene, prevention of haUTI, prevention of haSSI, prevention of havRTI, prevention of ICAI, disinfection practice and antiseptic treatment of patients, clothes and PPE, microbiological screening and special pathogens. The survey tool was primarily informed by questions to which CDC delivers clear recommendations. Additionally questions were included, which reflect common aspects in infection prevention, which management in daily hospital routine in Tyrol was of special interest for the authors.

Among 21 hospitals in Tyrol, 14 (yielding bed capacities between 29 and 1548 beds) agreed in participating the study. Among the participating hospitals was one tertiary care hospital and 13 regional hospitals belonging to the secondary care level. The majority of the reviewed hospitals were teaching hospitals (n=9). Eleven hospitals were public hospitals, while three were private hospitals. A total of 112 questionnaires were sent to the participating hospitals by postage, eight questionnaires to each hospital. Local infection control specialists forwarded the questionnaires as follows: One questionnaire each was sent to three senior physicians and three head nurses, belonging to different medical disciplines (surgery; internal medicine; non-surgery-non-internal medicine, subsumed cu" õqᵥjgtuö). In addition, one questionnaire each was filled from a senior physician and a head nurse of the infection control team, respectively (Figure 1). Notably, the interviewed participants possessed varying levels of infection control vtckpkpi‹" Vjg" rctᵥkekrcpvu" dgnqpikpi "vq "vjg "itqwr "õkphgevkqp "eqpvᵥqn "urgekcnkuvuö" *jgcf "pwtug" and senior physician) are well trained in infection control according to the requirements of the Austrian Federal Law on medical doctors from 1998 (senior physician) and the Austrian

6

Federal Law on Nurses (head nurse), respectively. The clinical participants received no additive training in infection control beside the prerequisites of the respective specialist vtckpkpiu" *kpvgtpcn" o gfkekpg." uwtigt{." õqvjgtuö." tgurgevkxgn{+0" The returned questionnaires were analyzed and the answers provided by the participants were compared with the current recommendations published by CDC. Additionally, the answers provided by the different specialties and the answers provided by nurses and physicians were compared among each other. Due to the legal prerequisites regarding data protection enforced by vjg" yqtmgtuø" council, the returned questionnaires had to be randomized prior to analysis in order to ensure full anonymity of the participating hospitals and staff. õ[guö"qt"õpqö" ygtg"eqpukfgtgf"cu"xcnkf" answers. Questions, which were answered validly by less than 50% of the participants, were excluded from analysis.

Statistical analysis

Received data from the present point-prevalence survey were analyzed with descriptive statistics. All data were calculated using Microsoft Excel® proprietary software. Concordance of answers provided by the participants was compared using Kappa statistics according to Landis and Koch[8]." gpeqo rcuukpi" vjg" vyq" vguvu" Eqjgpøu" mcrrc" *kpvgpfgf" vq" swcpvkf{" citggo gpv" dgvyggp" vyq" rctvkekrcpv+"cpf" Hngkuuø" mcrrc" *kpvgpfgf" vq" swcpvkf{" citggo gpv" qh" more than two participants) as a common approach to quantify agreements between participant answers. Eqjgpøu" mcrrc" ycu" wugf" vq" eqo rctg 1) the answers provided by the fkhhgtgpv" o gfkecn" urgekcnvkgu" *kphgevkqp" eqpvtqn." kpvgtpcn" o gfkekpg." uwtigt{." õqvjgtuö+" coqpi" each other, 2) the answers of the medical specialties with the recommendations of CDC, 3) the answers provided by the participating professions (nurses, physicians). Hngkuuø"mcrrc" ycu" used to determine the overall concordance of all participating groups.

Results

Return rates, response rates

Of 112 questionnaires forwarded to the participating hospitals in Tyrol, 77 were returned, equaling considerably high response rate of 68.8%. The different groups of participants, however, showed varying return rates ranging from 42.9% (senior physicians surgery) to 85.7% (head nurse infection control). Generally, head nurses showed a better response rate than senior physicians (73.2% vs. 64.3%). Among the included medical specialties, infection control teams showed the best response rate with 78.6%. "hqnmqygf"d{"vjg"õqvjgtuö group with 71.4%, the internal medicine group with 67.9% and the surgery group with 57.1%. It has to be stated, that not all questionnaires returned were filled out completely.

Aim I: Adherence to CDC-recommendations by discipline

The concordance rates between the participating medical specialties and CDC are presented in Table 1. The infection control specialists showed the best concordance rate (kappa = 0.68), yjkng"cnn"qvjgt"urgekcnkgu"*kpvgtpcn"ogfkekpg."uwtigt{."õqvjgtuö+"tgxgcngf"mcrrc"xcnwgu"qh"Ö 0.44, resembling fair concordance.

Aim II: Differences between clinical disciplines and differences between nurses and physicians

Differences between clinical disciplines

Analyzing the concordance of all four clinical disciplines, substantial agreement was observed (kappa = 0.74). Questions receiving discordant answers by the participating medical disciplines are reported in Table 2.

Differences between physicians and nurses

Overall, both groups ansygtgf"vjg"xcuv"oclqtkv{"qh"vjg"swguvkqpu"eqpeqtfcpn{0"Eqjgpøu"mcrrc" test delivered a kappa value of 0.82, yielding an almost perfect agreement. Questions receiving discordant answers by nurses and physicians are reported in Table 3.
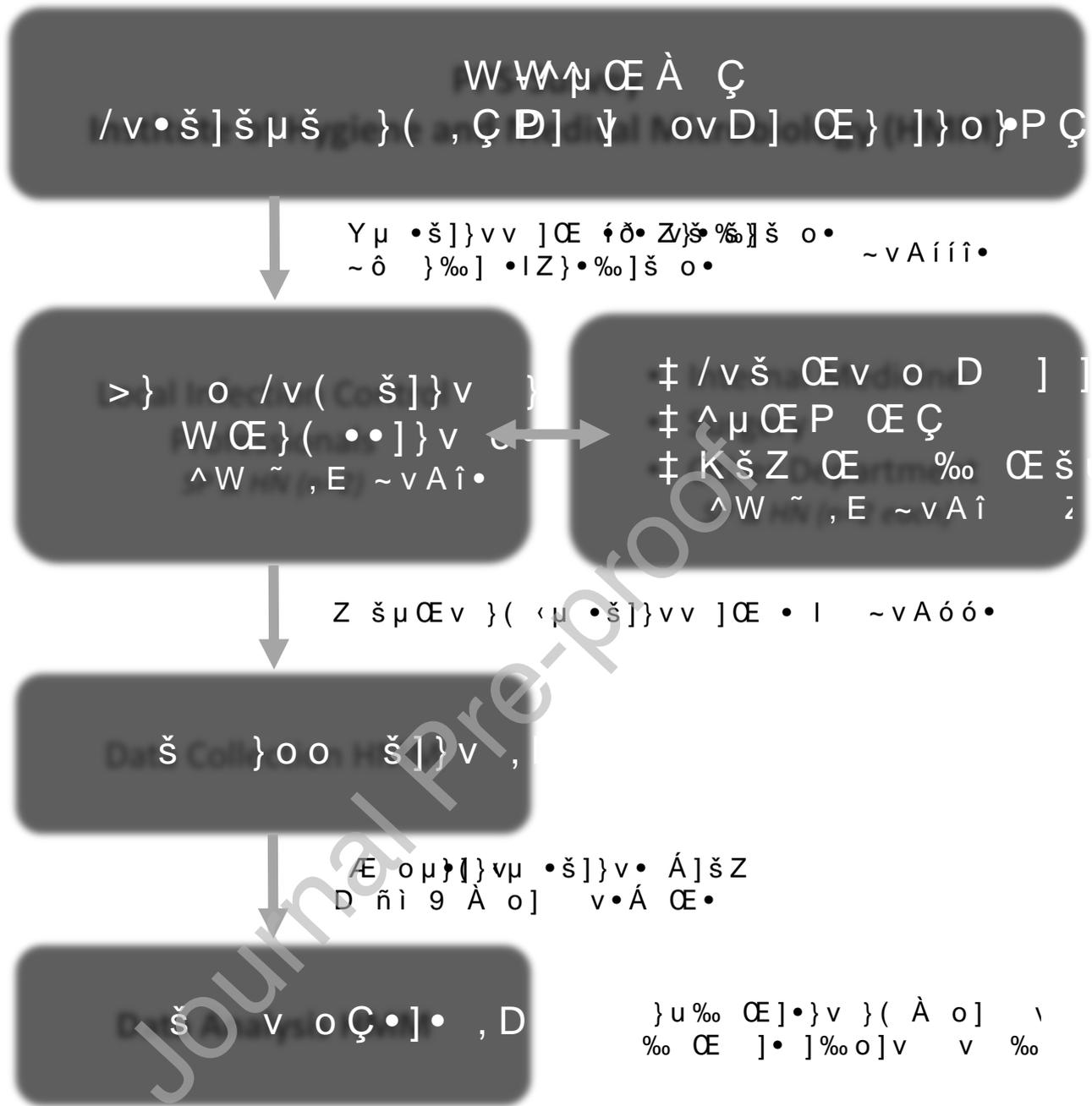
Figure 1

Figure 1 **Workflow of the present point-prevalence study (PPS) ó**

Multiple copies of the questionnaire were sent to the participating hospitals (n=14) to be completed by senior physicians (SP) and head nurses (HN) of each of the surveyed disciplines. Returned questionnaires (n=77) were collected and analysed at the HMM.

24