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Results of a survey of procedures for cleaning and disinfecting ambulances

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Abstract

Background. *In 2014, the Italian Study Group of Hospital Hygiene of the Italian Society of Hygiene, Preventive Medicine and Public Health (GISIO-SItI), in collaboration with the National Association of Medical Hospital Managers (ANMDO), conducted a survey on the availability of procedures for cleaning and disinfecting ambulances in order to assess the practices in use.*
Methods. *An online questionnaire was prepared through the Survey Monkey® platform and a web link access was sent to a convenience sample of ANMDO doctors working in healthcare management in public and private healthcare facilities.*
Results. *Ninety-six questionnaires were collected (26% response rate). In 73% of cases there was a procedure*

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for cleaning and disinfecting ambulances, which had been produced at a company level (67%) and involved various professionals. In 21% of cases the procedure had been prepared in expectation of an epidemic or following an epidemic (5%). The recommendations had been presented to the staff (90%), in 28% of cases through training events with verification of the knowledge acquired. Monitoring of the implementation of the procedure is planned in the majority of cases (88%), mainly through direct observation (92%). In 67% of cases the tender specifications for ambulance services did not include a section dedicated to cleaning and disinfection and, in the absence of a procedure, this was provided by the hospital in only 51% of cases.
Conclusions. *This survey represented a first step towards the development of guidelines for standardising procedures and providing indications useful for their evaluation and monitoring their implementation.*

Introduction

Medical service transport is an important element in the management of local healthcare; in recent years there has been progress in the functionality and safety of such transport and it is therefore essential to address issues related to the management of biological risks in a comprehensive manner. In fact, ambulances are care environments that are particularly prone to microbial contamination from biological excretions and secretions; furthermore, the emergency that often creates pressure towards rapid pre-hospital care and repeated calls at short time intervals make the level of attention to routine cleaning and disinfection critical. This problem acquires particular importance when considering the increasing prevalence of multiresistant bacteria both in hospital and in the community, with consequences also for the emergency care system (1).

Recently, several studies have been carried out to evaluate the presence of pathogens on ambulance surfaces (2-4)

In a study published in the American Journal of Infection Control, at least one Staphylococcus aureus strain was isolated from 69% of the tested ambulances. Of the S. aureus isolates, 77% showed resistance to at least one antibiotic and 34% to two or more antibiotics; in 12% of cases a methicillin-resistant S. aureus (MRSA) strain was identified (5).

A German study found that contamination by MRSA was present on 18 sampled surfaces in 11 ambulances out of 150 (7%) that had been defined as ready for service (6).

In another study, in addition to the surfaces, the microbial quality of the air within the emergency transport vehicles was assessed and, although the results were satisfactory, the presence of potentially pathogenic micro-organisms in the air and on surfaces in ambulances represents a hazard for medical staff and patients, reinforcing the concept that cleaning and disinfection techniques should be continuously developed and implemented (7).

On this background it was considered useful to investigate the current situation regarding environmental cleaning at a national level.

In 2014, the Italian Study Group of Hospital Hygiene (GISIO) of the Italian Society of Hygiene, Preventive Medicine and Public Health (SItI), in collaboration with the National Association of Medical Hospital Managers (ANMDO), conducted a national survey on the availability of procedures for cleaning and disinfecting ambulances.

Materials and methods

An online questionnaire was prepared through the Survey Monkey® platform, whose web access link was sent to a convenience sample of 364 registered members of ANMDO working in public and

private healthcare facilities. Subsequently, regional representatives were identified and asked to solicit the return of the survey by non-respondents.

The questionnaire was structured in the following parts:

- a request for general information regarding the responding facility and the emergency service vehicles available;
- verification of knowledge of the existence of the "Manual for emergency vehicle staff: control, verification and procedures for cleaning and disinfecting emergency vehicles" (1) in which the principles related to correct cleaning and disinfection are set out;
- the presence and method of drawing up the procedure for cleaning and disinfecting ambulances;
- the methods of distributing and verifying the implementation of the procedure.

The questionnaire was accompanied by a request to send a copy of the procedure in use, where available, in order to evaluate it using a checklist prepared ad hoc on the basis of good practices as inferred from scientific evidence.

Results

Ninety-six questionnaires were collected, for a response rate of 26%. In most cases (65%) the respondents stated that they were aware of the existence of the "Manual for emergency vehicle staff: control, verification and procedures for cleaning and disinfecting emergency vehicles" (1).

In 73% of cases there was a procedure for the cleaning and disinfection of ambulances, which had been prepared at a company level (67%) with the involvement of several professionals, but predominantly nurses and doctors with managerial roles in the healthcare facilities. In 21% of cases the document was prepared in expectation of an epidemic or following an epidemic (5%). The recommendations were presented to the staff in 90% of cases, in 28% through training events with verification of the knowledge acquired.

Monitoring of implementation of the procedures is planned in 88% of cases, almost exclusively through direct observation (92%).

In 67% of cases the tender specifications for ambulance services did not contain a specific section on cleaning and disinfection and, in the absence of a procedure, only in 51% of cases was this provided by the hospital.

Eight procedures were received and were evaluated through the checklist (Table 1).

Only two procedures described the way of recording that the cleaning and disinfection had been performed and none described how this was checked.

The responsibilities were identified in only three cases and reference was made to cleaning the exterior of the vehicle in only two documents.

The remaining items that were checked were usually present in the operational instructions, with heterogeneous levels of detail.

Reference guidelines were not mentioned, except in two procedures, nor was the frequency of revision of the indications provided. Only in one case was there information on the availability of backup vehicles during the periodic disinfection interventions.

Discussion and conclusions

Achieving best practices for cleaning and disinfecting environmental surfaces and patient safety equipment is an important factor in preventing the spread of infections. Vehicles dedicated to emergency transport services certainly represent an environment at high risk, including that of spreading infections, in the absence of clear, shared procedures.

Table 1 - Analysis, applying a checklist, of the eight procedures received

Items/Procedure	1	2	3	4	5	6	7	8
Is there a procedure for ambulance cleaning and disinfection?	yes	yes	yes	yes	yes	yes	yes	yes
Is it updated every 3 years?	ng	ng	ng	ng	ng	ng	ng	ng
Does it refer to national/international guidelines?	ng	ng	ng	ng	ng	yes	ng	yes
Are the responsibilities identified?	ng	no	no	no	no	yes	yes	yes
Are the methods for waste disposal indicated?	ng	no	yes	yes	yes	yes	yes	no
Are indications given regarding the different types of disinfectants to use?	ng	yes	yes	yes	yes	yes	yes	yes
Are indications given regarding the Personal Protective Equipment to use?	ng	no	yes	yes	yes	yes	yes	yes
Is the way for recording the disinfection practices described?	ng	no	no	no	no	yes	yes	yes
Is there programmed verification of the disinfection practices?	ng	no	no	no	no	no	no	no
If the vehicle is provided under a continuous agreement, is the availability of a back-up vehicle guaranteed during the periodic disinfection interventions?	ng	ng	ng	ng	ng	yes	ng	ng
Is cleaning of the patient's compartment planned after every transport?	yes	ng	ng	yes	ng	yes	no	ng
Is disinfection of the patient's compartment planned at least once a week?	ng	yes	no	no	no	yes	no	ng
Is disinfection of the patient's compartment planned if there are traces of organic material on the vehicle and/or equipment?	ng	ng	yes	yes	yes	yes	yes	yes
Is the exterior of the vehicle cleaned at least once a week?	ng	no	no	no	no	yes	no	yes
Is cleaning and disinfection of non-disposable equipment, materials and healthcare devices planned in the case of contact with intact skin, with no traces of organic material?	ng	ng	yes	yes	yes	yes	yes	yes
Is disinfection of non-disposable equipment, materials and healthcare devices planned in the case of contact with organic material?	ng	ng	yes	yes	yes	yes	yes	yes

Legend: ng = information not given

It is important to provide hospitals, which frequently resort to outsourcing to meet their emergency transport needs, precise guidelines in order that they can evaluate the purchase of the service and verify its delivery.

In this regard, a useful reference is the checklist contained in the "Infection prevention and control guidance for Emergency Medical Services (EMS) providers" developed by the Metropolitan Chicago Healthcare Council (8) which provides a list of actions to be taken for correct cleaning and disinfection of emergency service vehicles after each transport of patients, a summary of the activities related to routine cleaning of the patient's compartment and the driver's compartment and, finally, recommendations for cleaning and disinfection divided by material/object, the relative standards and the frequency of performing the procedures.

Although infection control in the pre-hospital context is influenced by many variables that are difficult to manage, for example, the ambulance crew pick up

patients from a broad range of settings (nursing homes, roads, houses) making it highly unlikely that a pathogen-free environment can be achieved, routine cleaning and disinfection of ambulances and equipment should be a priority, also in view of the fight against the spread of resistant microorganisms. Even though the low response rate, this research provides a knowledge base of the phenomenon as the first fundamental step towards the development of guidelines to standardise procedures and provide indications useful for their evaluation and for monitoring their implementation.

Disinfection of equipment that is not critical for patients' care and environmental surfaces must be included in the manuals/procedures. Ambulances are the first line of medical assistance and the risk of exposure to patients with infections or to pathogens is high. It is important to explain the principles of infection prevention and control through effective training with periodic assessment of the knowledge acquired and on-the-job checks. The preparation of instruments such as checklists and operating instructions for these activities, which also include organizational elements, such as the availability of backup vehicles, can be a useful support to improve and promote the prevention of infections and control their spread.

Riassunto

Risultati di un'indagine conoscitiva sulle procedure per la sanificazione delle ambulanze

Introduzione. Il Gruppo Italiano Studio Igiene Ospedaliera della SItI in collaborazione con ANMDO ha condotto un'indagine nazionale sulla disponibilità delle procedure per la sanificazione delle ambulanze al fine di valutarne lo stato dell'arte.

Metodi. È stato predisposto un questionario online; tramite la piattaforma Survey Monkey ®, è stato inviato un link web di accesso ad un campione di convenienza costituito da sanitari iscritti all'ANMDO operanti presso strutture sanitarie pubbliche e private.

Risultati. Sono stati raccolti 96 questionari (rispondenza pari al 26%). Nel 73% dei casi risulta disponibile una procedura per la sanificazione delle ambulanze, elaborata a livello aziendale (67%), coinvolgendo diverse figure professionali. Nel 21% il documento è stato redatto in previsione di un'epidemia o a seguito di un evento epidemico (5%). Le raccomandazioni sono state presentate agli operatori (90%), nel 28% attraverso eventi formativi con verifica delle conoscenze apprese. È previsto un monitoraggio dell'applicazione (88%), soprattutto attraverso osservazione diretta (92%). È stato segnalato che non esiste una sezione dedicata alla sanificazione nel capitolato di gara d'appalto per le ambulanze (67%) e che, in assenza di procedura, solo nel 51% dei casi questa viene fornita da parte della struttura ospedaliera.

Conclusioni. Questa ricerca ha rappresentato un primo passo per la messa a punto di linee guida per standardizzare le procedure e fornire indicazioni utili per la valutazione delle stesse e il monitoraggio della loro applicazione.

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