

VACCINATION COVERAGE AMONG HEALTH CARE WORKERS IN A TERTIARY CARE HOSPITAL – SAUDI ARABIA

By

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Abstract:

Background: Introduction: Vaccination of healthcare professionals is a critical issue for infection control, not only to protect them from transmissible agents, but also, to prevent nosocomial transmission of pathogens. **Aim of Study:** Assessment of vaccination coverage against vaccine preventable diseases among health care workers in a tertiary care hospital Riyadh region, Saudi Arabia. **Materials and methods:** Review of the records of staff health clinic to determine the number of health care workers fully vaccinated against each of recommended vaccines according to the Centers of Disease Control and Prevention (CDC) vaccination schedule. **Results:** The highest vaccination coverage rate was for hepatitis B vaccination (95.6%) with no significant differences between different professional categories, and lowest coverage was for varicella vaccine (10.4%) with no significant difference between critical departments. **Conclusion:** Vaccination against hepatitis B had the highest coverage rate among all health care categories and low vaccination rate observed for Measles, Mumps, Rubella (MMR) and varicella vaccine. Significant higher vaccination coverage of meningococcal vaccine among microbiology workers than other health care categories. Management policy and procedures should be directed and implemented to increase the vaccination coverage

for recommended vaccines according to the CDC vaccination schedule to HCWs.

Key words: Health care workers, Vaccination coverage, Vaccine preventable diseases, Immunization, Sero-conversion.

Introduction

Health care workers (HCWs) are at risk of exposure to vaccine-preventable diseases. Employers and HCWs have a shared responsibility to prevent occupationally acquired infections and avoid causing harm to patients by taking reasonable precautions to prevent transmission of vaccine-preventable diseases. Vaccination programs are therefore an essential part of infection prevention and control for HCWs (Centers for Disease Control and Prevention, CDC, 2011).

The broad implementation of vaccination programs during the second half of the 20th century has had an exceptional efficacy leading to the virtual disappearance or complete control of several infectious diseases. However, outbreaks of vaccine-preventable diseases continue to occur within health-care facilities among patients and health-care workers (HCWs), often in association with considerable morbidity and medical costs, because of diagnosis, treatment, and containment purposes. (Partot et al., 2010- Maltezou et al., 2012). Such outbreaks have been frequently traced

to HCWs, who may go unnoticed since many of these diseases are considered as childhood diseases, may be transmitted during the incubation period, or manifested with atypical symptoms. Vaccination of HCWs at risk constitutes a main infection control measure and it is justified in order to protect them, and also their vulnerable patients (Maltezou et al., 2012).

Hospital health directors should be empowered on the importance of vaccinating HCWs as a milestone of hospital risk management. More adequate training, including specific courses on vaccinations, is required for occupational health physicians (Partot et al., 2010)

Ensuring that health care workers (HCWs) are immune to vaccine-preventable diseases is an essential part of successful employee health programs. Optimal use of vaccines can prevent transmission of vaccine-preventable diseases and eliminate unnecessary work restriction. Prevention of illness through comprehensive HCWs immunization programs is far more cost-effective than case management and outbreak control. In Saudi Arabia, the

national vaccination recommendations for HCWs are generally the same as those recommended by the Centers for Disease Control and Prevention (Madani and Ghabrah, 2007).

Aim of the Study:

Assessment of vaccination coverage against vaccine preventable diseases among health care workers in a tertiary care hospital Riyadh region, Saudi Arabia.

Materials and Methods:

Participants:

Retrospective review of records carried out among health care workers (HCWs) in a tertiary care hospital in Riyadh region-Saudi Arabia with a 350-bed capacity to estimate vaccination coverage of the target group during the period between 2010-2012.

HCWs included in the study were categorized as: Physicians, Nurses, Technicians, and Housekeepers with average numbers of 380, 580, 110, and 280; respectively, during the study period.

Methods :

Review of the records of staff health clinic to determine the number of health

care workers fully vaccinated against each of recommended vaccines according to the CDC vaccination schedule that include hepatitis B vaccine, Influenza, Measles, Mumps, Rubella (MMR), Varicella, and Meningitis vaccines.

Data Management:

Data tabulated and vaccination coverage rate calculated as follows:-

1. Hepatitis B vaccination coverage that was calculated as percent of HCWs who completed the 3 doses of hepatitis B vaccine.
2. Vaccination coverage with MMR, varicella, and influenza vaccines for HCWs working in critical departments.
3. Vaccination coverage with meningococcal vaccine for microbiology workers and other health care workers.

Chi-square test was used in order to test the statistical difference in vaccination coverage among different professional categories. P-values of 0.05 or less were considered statistically significant. Statistical analysis conducted using SPSS, v.13.

Results

Table1: Hepatitis B vaccination coverage among different categories of health care workers

Vaccination coverage	Health care workers categories								Total No.= 1350		P value
	Doctors N=380		Nurses N=580		Technicians N=110		Housekeepers N=280				
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	
	369	97.1	548	94.5	107	97.3	260	93	1284	95	

Average hepatitis B vaccination coverage was 95% and there was no significant difference in the coverage rate between different professional categories.

Table 2: Coverage rate for different vaccines recommended for health care workers in different critical departments

Type of vaccine	Critical Department												P value
	ER N= 243		ICU N=167		AKU N=111		Burn Unit N= 45		CCU N=139		TOTAL N= 705		
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	
MMR	26	10.7	20	11.9	14	12.6	8	17.8	16	11.5	84	11.9	0.8
Varicella	25	10.3	17	10.2	13	11.7	5	11.1	13	9.4	73	10.4	0.8
Influenza	118	48.6	75	44.9	54	48.6	21	46.7	90	64.5	358	50.8	0.01*

NB: Emergency Room (ER), Intensive Care Units (ICU), Artificial Kidney Units (AKU) , Coronary Care Unit (CCU)].

* P< 0.05 means significant.

The highest vaccination coverage was for influenza vaccination (50.8%). HCWs in CCU showed the significant higher coverage rate (64.5%).

Table 3: Coverage rate for meningococcal vaccine recommended for microbiology workers

Meningococcal vaccine	No. of microbiology workers N= 18		Other health care workers N=1331		P value
	No.	%	No.	%	
No. of vaccinated HCWs	15	83.3	266	19.9	0.0001**

** P< 0.001 means highly significant.

Coverage of meningococcal vaccine for Microbiology workers was 81.8% which was highly significant than its coverage among other health care workers (20%).

Discussion

During the past decade, efforts made to build infection control capacity within health-care facilities. Although HCWs vaccination is justified in order to promote safety among HCWs and patients, suboptimal coverage against vaccine-preventable diseases recorded globally (Norsayani and Hassiml, 2003).

Hepatitis B virus (HBV) infection carries the maximum risk for healthcare workers (HCWs) and it is therefore indispensable that vaccination against hepatitis B administered to all classes of employees (Shariati et al., 2007).

The coverage rate for hepatitis B vaccination among HCWs in the current

study was 96% ; which is considered a much higher rate than that reported during the late 90's and early 2000 in Italy (Stroffolini et al., 2008) and also, data from Saudi Arabia, Egypt and Pakistan ranging from (39%-54%) (World Health Organization, WHO, 2003) and similar to the updated reports 10 years later ranging from 77-93% in different areas in Italy (Stroffolini et al., 2008).

This high hepatitis B vaccination coverage in our study compared to other studies is due to strict regulations and recommendations of HCWs vaccinations by Ministry of Health (MOH), Saudi Arabia. In addition to the wide educational awareness program for the prevention of parenterally transmitted viral infections addressed to HCWs in Saudi Arabia during

the past years, with routine vaccinations to all new employees working in high risk units.

Seasonal influenza vaccination coverage for HCWs in our study was 51%, which is higher than that reported in Italy (32.7%) (Tafari et al., 2009). Another Italian study reported very low coverage for influenza vaccinations in all specialties, ranging from 17.6% of the HCWs in the emergency department to 24.3% of those in the surgery department. The main reason for vaccination was the fear of transmitting the disease to their patients, without any difference according to job category, while for workers who refuse vaccination was a lack of fear of the disease (Esposito et al., 2008).

Although annual influenza vaccination has long been recommended for health care workers and is a high priority for reducing morbidity associated with influenza in health-care settings, (National Foundation for Infectious Diseases, NFID, 2003), (Poland, 2005) and (Pavia, 2010) national and international figures demonstrate low influenza vaccination coverage level (Centers for Disease Control and Prevention, CDC, 2011). Since the beginning January 1st 2007, the Joint Commission on Accreditation

of Health-Care Organizations required accredited organizations to offer influenza vaccinations to staff, including volunteers and licensed independent practitioners and to report coverage levels among HCWs (Joint Commission on Accreditation of Healthcare Organizations, JCI, 2006).

In the current study, there was low vaccination coverage for MMR and varicella vaccine (12%, 10%; respectively) which may be due to lack of awareness of the hazard of contracting infections and subsequent complications. Similar low vaccination coverage rate for these vaccines reported in tertiary care hospitals in Greece (Maltezou et al., 2012). On contrast a high vaccination coverage rate for varicella among medical students in France (63%) (Mir et al., 2012).

In this study high coverage rate for meningococcal vaccine was reported among microbiology workers (83.3%) which matches the CDC recommendations for meningococcal vaccinations of laboratory workers who are at risk of contracting infections (Centers for Disease Control and Prevention, CDC, 2011).

The current study also, revealed coverage rate of meningococcal vaccination among other categories of health care workers (20%) as meningitis vaccination is

mandatory for sharing in Hajj (considered as one of the most important mass gathering events in the world) (Gulf Cooperation Council, GCC, 2013).

Conclusion

Vaccination of HCWs is a critical issue for infection control, not only to protect them from transmissible agents, but also to prevent nosocomial transmission of pathogens. Vaccination against hepatitis B had the highest coverage rate among all health care categories, which explained by high-risk perception for hepatitis B among HCWs being a high-risk group for infection.

Low vaccination rate observed for MMR and Varicella vaccine, which attributed to lack of awareness of the hazard of contracting infections and subsequent complications. Significant higher vaccination coverage of meningococcal vaccine among microbiology workers than other health care categories. Further research recommended in order to understand the barrier to immunizations among HCWs and to overcome these barriers.

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