MMR Immunity in Healthcare Students

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Introduction

Healthcare students are at an increased risk of contracting and transmitting infectious illnesses during their studies. Measles and Rubella are potentially serious infectious illnesses and a particular hazard to immunosupressed or pregnant patients. Mumps has re-emerged as a significant cause of morbidity in the student population.

We report on the levels of immunity to each of these viruses among undergraduate healthcare students.

Method

The laboratory serological MMR status of all undergraduate students in Medicine, Dentistry, Dental Hygiene, Pharmacy, Speech and Language Therapy and Occupational Therapy was reviewed.

IgG laboratory serology results reported as "Positive" or "Immune" were deemed to show adequate or complete immunity. Results reported as "Negative"," Equivocal" or "Low-Immune" were deemed to show incomplete or inadequate immunity and MMR vaccination was recommended.

Statistical analysis was performed using SPSS software with p values measured using Pearson's chi-square test.

Results

Study population

Complete results were available for **90.5% (n =1170)** of the **1293** students registered for year **2008-09**.

Gender and Age

66.2%(n=775) female, mean age of **23.14 (18.01-48.01)**

Nationality

Students originated from the following regions;

Country	n	%
Ireland	824	70.4%
SE Asia	154	13.2%
North America	92	7.9%
Middle East	47	4.0%
EU	25	2.1%
Africa	23	2.0%
Other	5	0.4%

School

Students were registered in the following Schools;

School	n	%
Medicine	634	54.3%
Dentistry	227	19.4%
Pharmacy	110	9.4%
Clinical Therapies - OT	100	8.5%
Clinical Therapies - S+LT	98	8.4%

Results

Immunity to Measles Mumps and Rubella

93.8% (n=1097) students had serological evidence of adequate immunity to Measles.

85.2% (n=997) students had serological evidence of adequate immunity to Mumps.

91.1% (n=1066) students had serological evidence of adequate immunity to Rubella. *See chart 1*

Gender

Males had higher levels of inadequate immunity compared to females for each of the three Viruses

7.3% (n=29) of males v **5.7% (n=44)** of females had serological evidence of inadequate immunity to Measles. (p=0.266)

16.5% (n=65) of males v **13.9% (n=108)** of females had serological evidence of inadequate immunity to Mumps. (p=0.251).

12.9% (n=51) of males **v 6.8% (n=53)** of females had serological evidence of inadequate immunity to Rubella. (p=0.001). *See chart 1*

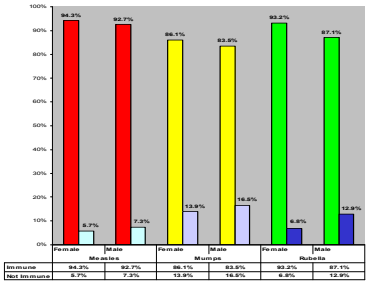

Chart 1 Students immunity status to Measles Mumps Rubella

Inadequate Immunity to one or more component of the MMR Vaccine

25.1% (n=294) students had serological evidence of inadequate immunity to one or more component of the MMR Vaccine, **74.9% (n=876)** were deemed to be immune to all of Measles Mumps and Rubella.

Gender

Males were more likely to have inadequate immunity to one or more component of the MMR compared to females **29.1% (n=115) v 23.1% (n=179)** (p=0.025)

Nationality

Students originating in North America had the highest levels of inadequate immunity to one or more components of the MMR, with EU students having the lowest levels of inadequate immunity

Inadequate levels of Immunity		
Region	n	%
North America	34	37.0 %
Africa	8	34.8 %
SE Asia	47	30.5 %
Ireland	194	23.5 %
Other	1	20.0 %
Middle East	9	19.1 %
EU	1	4.0 %

MMR Booster

All students with serological evidence of inadequate immunity to one or more component of the MMR were contacted and offered boosters

83.3% (n=245) of these students attended and received an MMR booster.

Conclusion

The National Immunisation Guidelines of Ireland recommend that

"Health-care workers should have serological proof of immunity to Measles Mumps and Rubella ***or*** *evidence of having received 2 doses of MMR. Those who are non-immune should receive the MMR vaccine*[1] *".*

As vaccination records are frequently incomplete, Universities training healthcare students depend on serological proof of immunity to determine which students require immunisation.

Our study confirms that healthcare students have sub-optimal levels of immunity to each of the individual components of the MMR vaccine, below the 95% required to ensure herd immunity. Male students were significantly less immune than female students, and there were differences in immunity status according to region of origin of the student.

Levels of immunity to each component of the MMR vaccine for students from Ireland are comparable to those previously reported as part of the ESEN 2 (European Sero-Epidemiological Network) project[2].

Despite a very active programme of call and recall, only 83.3% of students who were not immune to one or more component of the MMR attended for a booster, well below the 95% required.

As over one in four students appear to be inadequately immune to Measles Mumps or Rubella, it is important to consider revising the immunisation requirements and arrangements for all entrants applying for courses in healthcare so as to maximise update of the MMR vaccine, and so provide protection against these potentially serious infections.

References

1. National Immunisation Guidelines of Ireland. 2008 available from: www.immunisation.ie/en/HealthcareProfessionals/ImmunisationGuidelines2008/ (Last accessed June 2009)

2. Di Renzi M, Jackson S, Gee S, Cotter S. Increase in mumps in Ireland in late 2004. Euro Surveill. 2004;8(52):pii=2608. available from: www.eurosurveillance.org/ViewArticle.aspx?ArticleId=2608 (Last accessed June 2009)

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