

Seven day PCR testing for measles virus – a rapid screening tool to aid public health actions.

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Introduction:

o Measles is highly infectious and a single case can lead to multiple secondary cases.

- o Patients presenting with fever and rash aim to be quickly diagnosed to aid Infection control and public health



Intervention in response to case of measles	
MMR Vaccine	Within 3 days of contact
HNIG	Within 6 days of contact

Methods:

- o All samples sent for measles virus (MV) from 1 March 2013 to 01 September 2013.
- o Cases in UK were at highest level for 20 years.
- o Patients had symptoms of rash and fever lasting 3 days.
- o Throat swab or urine sample was collected in UTM from Copan.
- o In each case impact of result was measured with number of actions started or prevented.
- o Rapid testing was performed by easyMAG (biomeriux) extraction and PCR on ABI7500 (ABI)
- o Evaluation of BDMAX platform was assessed to aid processing at weekends.



Results:

Table 1. Patient Demographics

		Study Population
Prevalence (Samples)	mean	(pos cases)
Patient Age		15
0-5		80 (9)
6-10		22 (1)
11 -20		35 (11)
21-30		12 (1)
31-50		36 (4)
Sex:		
Female		46%
Male		54%

Table 2. Samples tested on each day of the week.

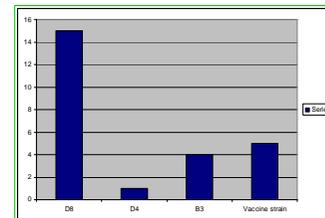
	Test performed	Run size range
	17	1-2
Tuesday	30	1-3
Wednesday	26	1-3
Thursday	34	1-3
Friday	32	1-3
Saturday	35	1-3
Sunday	12	1-2

Turnaround time was same day and mean of 4.3 hours. Positive cases.

26/ 186 cases tested positive. (Cq 16-29)

The BDMAX detected had 100% agreement with easyMAG/ABI method.

Figure 1. Genotypes



43 of 160 negative cases had oral swab testing done in reference laboratory and remained negative

Results: Advantages of PCR approach Consequences of measles diagnosis on same day of notification

- o Contacts given MMR within 3 days
- o Vulnerable groups given HNIG
- o Health care workers had immunity checked within 3 days of contact
- o One HCW excluded from work as IgG-negative, excluded on day 5 and was not infectious while on the ward.
- o One outbreak in traveller community (D8)
- o All other cases not linked and no secondary cases seen.

o Disadvantages of PCR approach. – A Case

- o Seen in A&E widespread rash, no cough, runny nose, sore throat and febrile for one day. Impression – Scarlet fever. Discharged. Re-attended next day. Rash which now much redder. Noted maculopapular rash on form. Tested for measles – Positive Cq 27. Had 1x MMR 3/12 ago. Lot of contacts, public health actions.
- o Typing – MMR Vaccine strain – reported 6 weeks later
- o PCR will detect both vaccine and wild type strain

Conclusions:

- 7-Day testing with rapid diagnostic real-time PCR enables prompt management of cases.
- o PCR positive can indicate MMR vaccine for 3 months or potentially longer
- o Use of BDMax platform gives flexibility for molecular service and supports periods of time when there is minimal staffing
- o Rapid diagnosis and use of MMR provide vital tools in preventing further spread in outbreaks.

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