P0448
Poster Session I
Emerging viruses / viral infections

MONITORING OF SUPPLEMENTARY IMMUNISATION EFFECT ON WILD POLIOVIRUS CIRCULATION USING COMPLEMENTARY ENVIRONMENTAL AND STOOL SURVEILLANCE APPROACHES FOLLOWING REINTRODUCTION OF WILD POLIOVIRUS TYPE 1 INTO ISRAEL

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Objectives: Israel has maintained a highly sensitive routine Poliovirus environmental surveillance (PEV) early warning system since 1989. In 2005, an IPV- only immunisation programme replaced the combined OPV/IPV schedule. Silent wild poliovirus 1 (WPV1) reintroduction and subsequent widespread circulation primarily in southern Israel was detected by PEV in April 2013 and a nationwide supplementary immunisation activity (SIA) with bOPV wasinitiated in August 2013 amongst 0-8 year-olds not previously given OPV. This was followed by a second dose in highly affected communities starting Mid October. Intensified PES and stool surveillance were designed to monitor the effect of the SIA.

Methods: Composite 24h sewage samples were collected from all sites with extensive WPV1 circulation and faecal samples were obtained from a convenience sample of asymptomatic 0-8 year-olds on a weekly basis. Samples were analysed at the National Poliovirus Laboratory by direct testing using rapid semi-quantitative qRT-PCR assays for WPV1, Sabin 1 (S1) and Sabin 3(S3) which were developed and applied *ad hoc* during the incident. Virus culture and molecular identification and sequencing methods according to WHO protocols were applied in parallel on all analysed sewage samples as well as on positive stool samples. WPV1 trends in sewage were expressed as Ct values whereas trends in human transmission were measured by prevalence of faecal WPV1 excretion.

Results: The kinetics of WPV1, S1 and S3 excretionwere monitored in sewage and stool samples (Sep-Nov 2013). Environmental monitoring showed a substantial decrease of WPV1 and increase of S1 and S3 concentrations.The trend in WPV1 concentration was in negative correlation and that of S1/S3 concentration was in direct correlation with bOPV SIA coverage in all communities monitored. For example, in Rahat (WPV1 epicentre) where bOPV coverage for the first and second doses was 90.7% and 47.7%, respectively, the sewage Ctvalues were 36.6 for WPV1 in early September and rose to borderline positivity(Ct 43.8, near detection limit) in November. In respective months, Ct values for S1/S3 were 34.9/29.2 and went down to 30.9/28.5. Stool surveillance included 1,008 samples and demonstrated a gradual decrease in prevalence ofWPV1 excretion amongst 0-8 year-olds overfrom September (5.3%), through October (2.1%) and November (0.7), thus confirming the SIA effect reflected by sewage monitoring. Similar trends were evident inother monitored areas.

Conclusions: Combined environmental and faecal sample surveillance can serve as complementary methods for monitoring the effectiveness of bOPV administration in response to a WPV incident. This approach is particularly useful when WPV reintroduction lacks clinical poliomyelitis cases. qRT-PCR is a highly useful semi-quantitative method and could be readily applied in field studies of WPV circulation and support decision making.