Author's response to reviews

Title: A National Cross-sectional Study for Poliovirus Seroprevalence in the Republic of Korea in 2012: Implication for Deficiency in Immunity to Polio among Middle-aged People

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Author's response to reviews: see over
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Jodie McVernon
Editor of Viral disease section
BMC Infectious Disease

Dear Dr. Jodie McVernon

Enclosed please find the revised manuscript entitled “A National Cross-sectional Study for Poliovirus Seroprevalence in the Republic of Korea in 2012: Implication for Deficiency in Immunity to Polio among Middle-aged People”. The manuscript has been revised according to reviewers’ suggestions. The list stating our disposition to the comments of the reviewers is also included below. We would be pleased if you would consider this manuscript for publication in the BMC Infectious Disease.

Thank you for your consideration. I look forward to hearing from you.

Sincerely,
Ji-Yeon Hyeon

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Reviewer's report 1

1. Detailed information about the two different vaccines, OPV and IPV against poliovirus including what kind of antigens and vaccination schedules in Republic of Korea should be provided in the introduction section.
   
   Our response: The reviewer’s points are legitimate and appreciated. We described the details of OPV and IPV and vaccine schedules in Republic of Korea in line 124 as below.
   
   “The oral PV vaccine (OPV), which contains the Sabin PV1, PV2, and PV3 strains, was introduced to the Republic of Korea in the early 1970s and included in the national immunization program [10]; at the end of 2004, it was replaced with the inactivated PV vaccine (IPV), which includes formalin-inactivated the Mahoney strain of PV1, the MEF-1 strain of PV2, and the Saukett strain of PV3 [7, 10, 11]. The immunization of PV is given three times to all infants at 2, 4, and 6-18 months of age, followed by a booster shot before school entry at between 4 and 6 years of age [10].”

2. The colour scheme used for the figure 2 should be revised. Especially it is hard to distinguish between high and no groups.
   
   Our response: We completely agree to the reviewer’s point. As the reviewer pointed, Figure 2 was revised.

3. The authors found relatively low level of seropositive against poliovirus in middle-aged group compared to other age groups. Is there any difference in clinical symptom or susceptibility of poliovirus between different age groups? Please provide detailed information about clinical symptom or susceptibility of poliovirus between different age groups in the discussion section.
   
   Our response: The reviewer’s points are legitimate and appreciated. As the reviewer pointed, we provided information about clinical symptom or susceptibility of poliovirus between different age groups in line 270 as below.
   
   “Differences in the population susceptibility or clinical symptoms of poliomyelitis between different age groups have not been described; however, several polio outbreaks affecting adults in WPV-free countries have been previously reported, while poliomyelitis is rarely
observed in adults in such countries [20-22]. The older age groups may contribute to WPV transmission without clinical symptoms, and the WHO has therefore recommended older individuals to get vaccinated as part of the outbreak response [www.polioeradication.org/Portals/0/Document/Resources/StrategyWork/]."

**Quality of written English:** Needs some language corrections before being published

Our response: As the reviewer’s comment, language in the manuscript edited by Editage Company.

**Reviewer's report 2**

1. The status of the informed consent for serological studies should be mentioned.

   Our response: As the reviewer suggested, the status of the informed consent for serological studies was mentioned in line 298 as below.

   “The institutional review board of Korea Centers for Disease Control and Prevention approved the use of the samples (number: 2012-08EXP-07-R), and all patients provided written informed consent before enrolling in this study.”

2. Page 3, line 54; “to document the poliovirus since 2004”. “poliovirus” should be “polio Immunity” ??

   Our response: As the reviewer pointed, we revised in line 53 as below.

   “This study is the first report to document the polio immunity after 2004, when an inactivated polio vaccine (IPV) was introduced in the Republic of Korea.”

3. Page 4, line 89; Ref. 9 is OK but an important paper by Luo at al (N Engl J Med. 2013; 369: 1981-90) should be cited to.

   Our response: As the reviewer’s comment, we added Luo et al’s study (N Engl J Med. 2013; 369: 1981-90) to reference in line 112 as below.

   “For example, in 2011, a strain of WPV1 that was genetically linked to a virus currently circulating in Pakistan was isolated in China, where the last indigenous poliomyelitis case had occurred in 1994 [9].”
4. Page 5; Study design: Is the immunization history with OPV or IPV available for the individuals?

5. Page 10, line 223; Is there any possibility of unimmunized individuals for the sero-negative cases?

   Our response: The immunization history of individuals in this study is not available, so we couldn’t confirm the possibility of unimmunized individuals for the seronegative cases. However, the immunization rate of PV has been sustained at an estimated 90-95% since 1980 in Republic of Korea. These are described in line 130 and 141 as below.

   “The immunization level for PV has been sustained at an estimated 90-95% since 1980 [12] “
   “Individuals who randomly attended hospitals for a blood test due to reasons not related to PV immunization were enlisted in the study, although the immunization history of the individuals was not available.”

6. Page 11, line 242; Ref. 7 (published in 2005) is too old. Current polio status is available at the GPEI web site (http://www.polioeradication.org). The last type 3 wild poliovirus was isolated in Nov 2012.

   Our response: The reviewer’s points are legitimate and appreciated. As the reviewer mentioned, we referred the GPEI web site, and added to manuscript in line 278 as below.

   “On the other hand, PV1 and PV3 are currently endemic in several countries in Africa and Asia, with the most recent WPV3 isolated in November 2012 [http://www.polioeradication.org].”

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

   Our response: According to reviewer’s comment, we performed Chi-square test and linear-by-linear association to calculate statistical significance using with SPSS version 15.0.