

Interference of Vaccine Derived Polio Viruses with Diagnosis of Enteroviral Diseases in Neonatal Period

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ABSTRACT

Introduction: Enteroviruses (EV) are a common cause of neonatal sepsis especially at the junction of summer and fall.

Aim: This study was planned to find the frequency of Enteroviral (EV) sepsis among neonates with clinical sepsis.

Materials and Methods: This is a prospective descriptive study. Rectal and pharyngeal swab samples were taken from all neonates with clinical sepsis and a control group of neonates with simple jaundice. EV was confirmed by both cell culture and RT-PCR. Anti polio antiserum was used to differentiate Polioviruses from Non Polio EVs (NPEV).

Results: We had 67 neonates with clinical sepsis and 31 cases of simple jaundice during 105 days. NPEVs were isolated from 2 cases (2.9%) of the sepsis arm and one neonate (3.2%) of the jaundice group. Polio virus was isolated from 16.2% and 15.3% of OPV recipients in the sepsis and jaundice group respectively.

Conclusion: Enteroviruses were not a common cause for neonatal sepsis in Nemazi hospital at the time of this study. OPV vaccinated neonates commonly pass the vaccine virus in their pharynx and stool which can be mistaken with NPEV.

Keywords: Enterovirus, Neonate, Sepsis

INTRODUCTION

Enteroviruses (EV) are a common cause of neonatal sepsis especially at the junction of summer and fall. The aim of this study was to find the frequency of enteroviruses in neonates who were admitted for sepsis work up in Nemazi hospital (Iran. Shiraz).

MATERIALS AND METHODS

During an observational study from August 2001 up to November 2001, rectal and pharyngeal swab samples were taken from all neonates who were admitted in neonatology ward of Nemazi Hospital, with clinical diagnosis of sepsis, and also from otherwise healthy neonates who were admitted for neonatal jaundice (The reason for choosing the control group was to find how many of the EV positive neonates are symptomatic). The samples were transmitted in transfer tubes to cell culture media and for those with cytopathogenic effect (CPE) typical for EVs, RT-PCR for Enteroviruses was done. Anti polio antiserum was used to differentiate Polioviruses from Non Polio Enteroviruses (NPEV) on cell culture media.

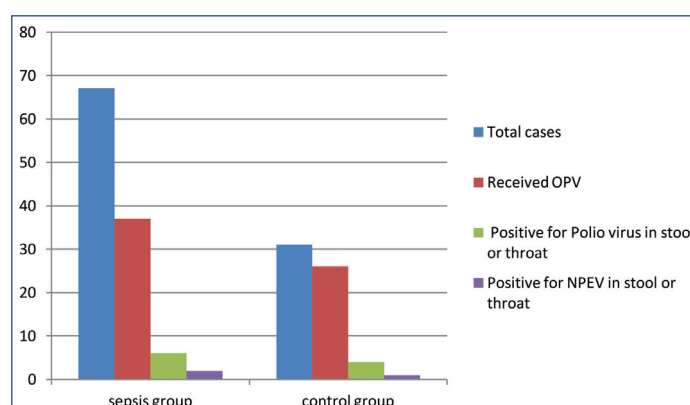
RESULTS

During 105 days, 67 neonate with clinical diagnosis of sepsis (mean age 16 days) and 31 non septic neonates with jaundice (mean age 9.1 days) were entered to the study. EV was isolated from 13.2% (13 cases) of all neonates, but just 3 (23%) of the EV isolates were NPEV. All of the positive EV samples were from rectal swabs except one case in which both the rectal and pharyngeal sample were positive.

In the sepsis group 37 and in the jaundice arm 26 neonates had received Oral Polio Vaccine (OPV) which Polio virus was isolated from 6 (16.2%) and 4 (15.3%) of them respectively. The mean age of polio virus positive cases was 16 days (2-27 days). None of the non vaccinated neonates were positive for Polio viruses. NPEV was isolated from 2 cases (2.9%) of the sepsis arm and one neonate (3.2%) of the jaundice group [Table/Fig-1].

DISCUSSION

Sepsis is one of the leading causes of admission in the neonatal period, a bacterial pathogen is found in less than 20% of sepsis



[Table/Fig-1]: Frequency of poliovirus and non polio enteroviruses isolation among neonates in Shiraz.

work ups in the first 2 month of life [1]. EVs are one of the most common causes of neonatal nonspecific febrile illnesses, accounting for approximately half of the hospital admissions for ruling out sepsis [2]. The rate of viral pathogens in febrile infants (1 to 90-day-old) is 3 times of bacteria [3]. In Netherlands EVs were detected in 57% of neonates (median birth weight: 3600) who were admitted for clinical sepsis in the paediatrics ward, while bacterial blood culture was not positive in any of them [4]. In a study among 139 neonates with culture negative sepsis (from Kuwait) EVs were detected in 24% of serum samples by PCR [5]. Jordán from Spain has reported the aetiology of fever in 72 febrile neonates for whom a final cause could be found. Bacterial infections were found in 62 patients (including 57 urinary tract infection, 3 sepsis and two cases of meningitis), while EVs (by PCR) were positive in 10 neonates [6]. Verboon has reported the retrospective results of viral infections in a NICU (in Netherlands) during a 12-year period. A viral infection was confirmed in 1% of 5396 admitted infants, EV and parechovirus (39%) respiratory syncytial virus (29%) and rotavirus (10%) were the most common viral pathogens in this study [7]. In a group of 75 premature (<32 weeks) neonates who were followed for 4 weeks following admission to a NIC in Sydney Australia, viral RNA or DNA (by multiplex PCR) was detected in 5.7% of stool samples, the culprit viruses were norovirus (1.9%), enterovirus and herpes simplex each

one (1.2%), cytomegalovirus (0.7%), Epstein-Barr virus (0.5%) and rotavirus (0.2% [8]). In Mashhad we have shown that EVs are by far the most common cause of meningitis in the neonatal period and EV meningitis was 13 times more common than bacterial meningitis [9].

Oropharyngeal and stool samples for diagnosis of EV diseases have several limitations, including positive results from OPV and also prolonged carriage from a previous EV infection. However, most non-polio EVs in stool is aetiologically related to the current illness. A study in Estonia which evaluated the occurrence of enteroviruses in feces samples of 55 infants before and after OPV vaccination showed that 5.1% of non-vaccinated neonates had positive stool culture for EV (all non polio EV), while at the 6th month of life (after at least two doses of OPV) 67% of stool samples contained EV (all polioviruses) [10]. In South Africa 30% of stool samples from healthy (vaccinated) children (0-18 month) tested positive for polioviruses. Polio virus excretion generally stopped by the end of the second week after each vaccination [11]. In Bangladesh 17.6% of the stool samples from infants were positive for polioviruses up to 25 days after vaccination [12]. This rate was 15%-16% in our study, although all the cases in our group were not in the first 2 weeks after vaccination.

CONCLUSION

Enteroviruses were not a common cause for neonatal sepsis in Nemazi hospital at the time of this study. Isolation of NPEV from pharynx or feces is not specific for EV sepsis and asymptomatic passing of virus occurs. OPV vaccinated neonates commonly pass the vaccine virus in their pharynx and stool which can be mistaken with NPEV.

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