

Serological Classification of Porcine Enteroviruses Isolated in Korea

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國內에서分離된 Porcine Enterovirus의血清學的分類

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抄錄: 國內에서 飼育 중인 病豚의 糞便(8例), 乳汁(1例) 및 腦組織(1例)으로부터 分離된 porcine enterovirus(PEV)의 血清型을 分類하기 위하여 補體結合反應을 實施하였던 바 다음과 같은 結果를 얻었다.

糞便에서 分離된 PEV는 血清型 8型(CPE type II)으로, 乳汁 및 腦組織에서 分離된 PEV는 血清型 3型(CPE type I)으로 分類되었으며, 血清型 3型은 血清型 1型(Talfan virus)과 交叉反應이 일어났다.

以上の 結果로 보아 國內에 分布하는 PEV의 血清型은 적어도 2種 以上임을 알 수 있었다.

Introduction

A large number of porcine enteroviruses(PEV) have been isolated from the various organs of pigs showing either clinical or subclinical signs in various countries(Lynch *et al.*, 1984; Fujisaki *et al.*, 1981; Richard *et al.*, 1973; Watt *et al.*, 1971; Koestner *et al.*, 1962; Harding *et al.*, 1957).

While most PEV infection is asymptomatic, various clinical syndromes have been associated with certain serogroups(Derbyshire, 1986). PEV were classified

into 11 serogroups by complement fixation test(CFT) (Knowles, 1983; Knowles and Buckley, 1980).

Although a field occurrence and experimental reproduction of polio-encephalomyelitis in pigs caused by PEV were reported in Korea(Shin and Lee, 1985; Kim *et al.*, 1980; Kwon *et al.*, 1978), there are few articles on the serological classification of the Korean isolates of PEV.

This paper deals with the results of CFT carried out on PEV isolated in Korea, using type specific antisera(Knowles and Buckley, 1980).

Materials and Methods

Viruses: Ten samples of PEV were used (Shin, 1987) and these viruses were passaged twice on black goat kidney (BGK) cells (Kwon *et al.*, 1980). PEV were originally isolated from the feces (8 samples), the milk (1 sample) and the brain (1 sample) of the diseased pigs in 10 different swine herds (Table 1). These isolates of PEV had common physicochemical characteristics as PEV (Fujisaki *et al.*, 1981; Kwon *et al.*, 1978; Kasza and Alder, 1965).

Complement fixation test: All of 10 samples of PEV were passaged once on IB-RS-2 cells, frozen at -20°C , thawed and cellular debris removed by low speed centrifugation. This material was used as antigen in the CFT as described earlier (Knowles and Buckley, 1980).

Results

The CPE of the virus isolates on both the BGK and the IB-RS-2 cells were clear. PEV originated from the feces belonged to CPE type II and those from the milk and the brain to CPE type I

(Table 1).

Two PEV serotypes were identified from 10 samples. The viruses isolated from the feces belonged to serotype 8 and the viruses isolated from the milk and the brain to serotype 3. The cross reaction of serotype 3 occurred in CFT especially with serotype 1, Talfan virus (Table 1).

Discussion

PEV were classified into 11 serogroups by CFT which was proved to be a very valuable aid to the typing of PEV (Knowles, 1983; Knowles and Buckley, 1980). Up to the present time, a field occurrence and reproduction of poliomyelitis in pigs caused by PEV were reported in Korea (Chang and Lee, 1986; Shin and Lee, 1985; Kwon *et al.*, 1978), although the serotype of the Korean isolates of PEV were not yet classified. In this study it can be said that at least 2 serotypes of PEV (serogroup 3 and 8) have existed in Korea. It is interesting that PEV were isolated from the maternal milk of the piglets showing neural disorder. It was considered that PEV were introduced into milk during maternal

Table 1. Complement Fixation Tests on Porcine Enteroviruses Isolated from the Diseased Pigs in Korea

Antisera	CPE group:	I								II			III		I	III		
		1	2	3	4	5	6	7	8	8	8	8	9	10			11	SVDV
Viruses ^{a)}	Origin of Isolates	CPE Group	Strain: Talfan T80 02b PS36 F26 PS37 F43 V13 A1 UKG AUS UKG LP54 UKG															
			H. S. T.	2048	512	1024	1024	512	128	256	512	768	768	768	4096	512	256	1024
1	Feces	II	— ^{b)}	—	—	—	—	—	—	—	>512 ^{c)}	>512	>512	384	—	—	—	—
2	"	II	—	—	—	—	—	—	—	—	>512	>512	>512	192	—	—	—	—
3	"	II	—	—	—	—	—	—	—	—	>512	>512	>512	384	—	—	—	—
4	"	II	—	—	—	—	—	—	—	—	>512	>512	>512	>512	—	—	—	—
5	"	II	—	—	—	—	—	—	—	—	>512	>512	>512	>512	—	—	—	—
6	"	II	—	—	—	—	—	—	—	—	>512	>512	>512	>512	—	—	—	—
7	"	II	—	—	—	—	—	—	—	—	>512	>512	>512	384	—	—	—	—
8	"	II	—	—	—	—	—	—	—	—	>512	>512	>512	>512	—	—	—	—
9	Milk	I	16	—	192	—	16	16	—	—	ND	ND	ND	—	—	—	—	—
10	Brain	I	64	—	512	—	48	16	24	—	ND	ND	ND	—	—	24	—	—

a): After second passage on black goat kidney cells and one passage on IB-RS-2 cells.

b): Less than 1 in 16.

c): Reciprocal of serum dilution giving 50 per cent haemolysis.

H. S. T. = Homologous serum titer.

CPE = Cytopathic effect.

viremia. We can not rule out the possibility that the diseased piglets were infected with PEV either before or after parturition, although the piglets were not examined in the present study. PEV have been known as one of the causative agents associated with fetal and early neonatal death(Fujisaki *et al.*, 1981; Huang *et al.*, 1980; Kirkbride *et al.*, 1978).

Korean isolates of PEV exhibited 2 types of CPE on both IB-RS-2(Knowles and Buckley, 1980) and BGK cells(Shin, 1987; Kwon *et al.*, 1978). The PEV isolated from the feces showed CPE type II and the PEV isolated from the milk and the brain CPE type I. Cross-reaction of Korean isolates of PEV (serotype 3) occurred with Talfan virus(serotype 1) antisera. In this connection, similar findings were recorded in 02b strain by CFT(Knowles and Buckley, 1980).

Further studies will be necessary to clarify the pathogenicity of Korean isolates of PEV in pigs.

Summary

Serological classification was carried out on 10 samples of PEV isolated from the feces, the milk and the brain of the diseased pigs in Korea by CFT using type specific antisera of PEV.

Ten samples of PEV were classified into 2 serotypes which were serotype 3 and 8. PEV from the feces belonged to serotype 8 and those from the milk and the brain to serotype 3. The cross reaction of serotype 3 occurred especially with serotype 1, Talfan virus.

It can be said that at least 2 serotypes of PEV have existed in Korea.

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