

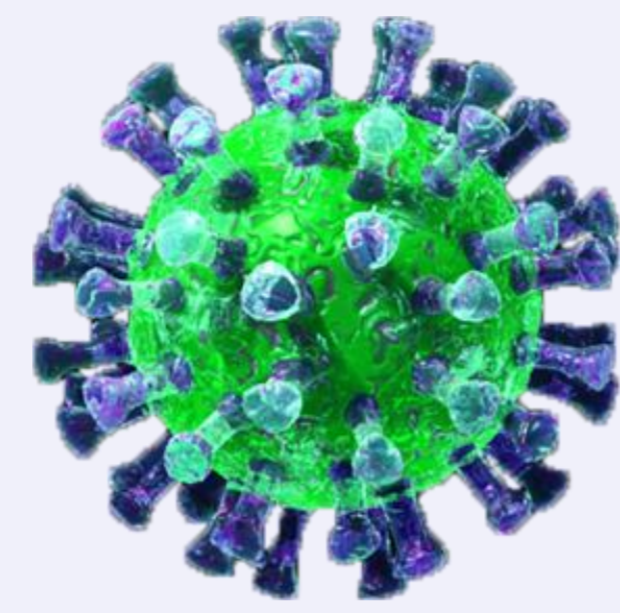
# EFFECTS OF ISOLATION ON HEMODIALYSIS PATIENTS WITH MERS-COV EXPOSURE IN KOREA: A COHORT STUDY

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## Introduction

- In 2015, the Middle East respiratory syndrome coronavirus (MERS-CoV, **Figure 1**) outbreak imposed a huge threat to public health in Korea.
- A total of 186 confirmed patients with MERS-CoV infection were reported, including one case with maintenance hemodialysis (HD).
- Dialysis patients in three HD units were incidentally exposed to patients or health care workers with confirmed MERS-CoV infection.
- To interrupt the spread of MERS-CoV, they were isolated from other people during outbreak. There are very few studies evaluating the effectiveness of isolation to reduce the spread of respiratory viruses in HD unit.
- This study examined the influence of isolation on HD patients with MERS-CoV exposure.



**Figure 1.** Middle East respiratory syndrome coronavirus

## Methods

- We studied 116 HD subjects (3 hospitals) that were exposed to MERS-CoV and isolated (**Figure 2**).
- MERS-CoV serological study for asymptomatic infections was performed. The interval from exposure to the blood sampling was 2, 4 and 16 weeks.
- Secondary transmission were identified on the basis of reactivity on enzyme-linked immunosorbent assay (ELISA) against MERS-CoV S1 antigen, supported by reactivity on recombinant S-protein immunofluorescence (IFA) and demonstration of spike pseudoparticle neutralization assay (ppNT).
- Hematologic and biochemical parameters were also examined during isolation period.



**Figure 2.** Different types of isolation practices.

## Results

- In our study population, mean age was 62.2 years; 77 (66%) were men, 52 (45%) were diabetes. Isolation period from the exposure was 15.0±3.0 days (4-22).
- Hospitalized quarantine care (isolation room) was 71 (61%), cohort isolation was 34 (29%) and self-imposed quarantine was 11 (10%) (**Table 1**).
- Three cases were screened in test of serum samples by anti-MERS-CoV (IgG) ELISA. But, it proved no case of secondary transmission of MERS-CoV in HD units as results for IFA and ppNT.
- The proportion of patients with Hb <10 g/dL was higher during isolation period than that before isolation. Other biochemical parameters during isolation period were similar to those before isolation.

- During the 12-month follow-up period, there were 10 deaths (8.6%) regardless of isolation.

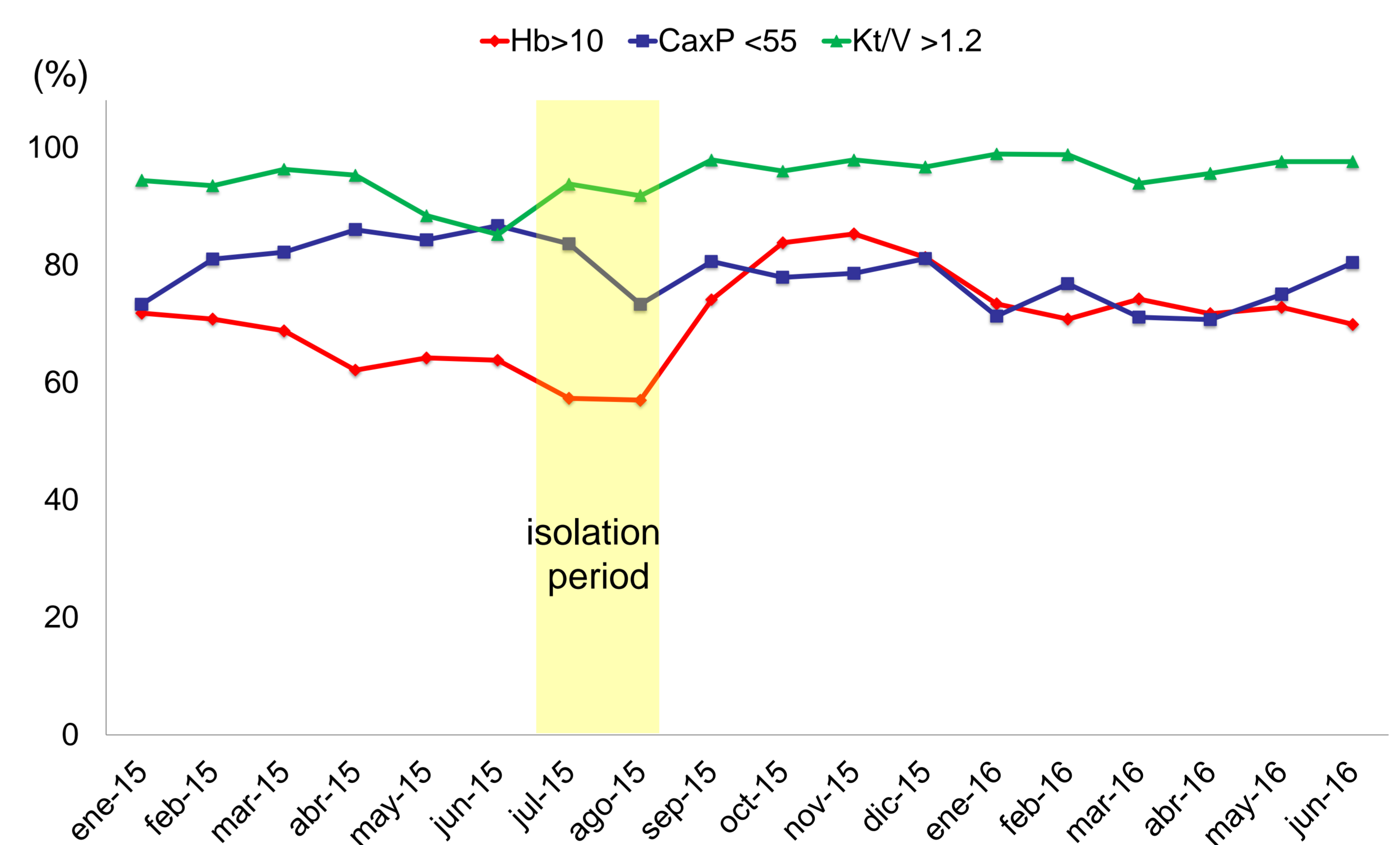
**Table 1.** Characteristics of HD patients with MERS-CoV exposure .

	Total	Hospital A	Hospital B	Hospital C
Maintenance dialysis patients	263	92	135	36
MERS-CoV exposure patients	116	73	9	34
Age (years)	62.2±14.1	61.3±13.9	56.4±13.1	65.8±14.2
Male	77 (66.4%)	46 (63.0%)	7 (77.8%)	24 (70.6%)
Diabetes	52 (44.8%)	33 (45.2%)	5 (55.6%)	14 (41.2%)
HD duration (years)	4.4±4.4	3.8±3.8	2.0±2.5	6.2±5.5
AVF	95 (81.9%)	65 (89.0%)	9 (100%)	21 (61.8%)
Isolation period (days)	15.0±3.0	16.7±2.2	9.3±2.6	12.9±0.3
Exposure place	107 HD unit 9 outside of HD unit	HD unit (100%)	Outside of HD unit (100%)	HD unit (100%)
Isolation practices		<ul style="list-style-type: none"> <li>44 hospitalized quarantine</li> <li>28 cohort isolation</li> <li>1 self-imposed quarantine</li> </ul>	<ul style="list-style-type: none"> <li>3 hospitalized quarantine</li> <li>6 cohort isolation</li> </ul>	<ul style="list-style-type: none"> <li>24 hospitalized quarantine</li> <li>10 self-imposed quarantine</li> </ul>
HD practices		<ul style="list-style-type: none"> <li>9 isolation room</li> <li>36 dialysis room</li> <li>23 cohort isolation</li> <li>3 container</li> <li>2 CRRT</li> </ul>	<ul style="list-style-type: none"> <li>3 dialysis room</li> <li>6 cohort isolation</li> </ul>	<ul style="list-style-type: none"> <li>4 isolation room</li> <li>30 dialysis room</li> </ul>

**Table 2.** Serologic analysis of HD patients with MERS-CoV exposure .

	Total	Hospital A	Hospital B	Hospital C
ELISA (IgG)	4/116*	2/73*	1/9	1/34
IFA	1/116*	1/73*	0/9	0/34
Neutralization assay	1/4*	1/2*	0/1	0/1

\*One confirmed HD patients with MERS-CoV infection



**Figure 3.** Change of laboratory data during the isolation period

## Conclusion

- This study suggested that isolation itself was sufficient to prevent the spread of MERS-CoV.
- Although the best isolation system in HD units has not been determined, simple and low-cost intervention would be adequate for stopping the spread of virus from person to person.
- Further studies of cost-effectiveness of different strategies of isolation management are needed.