Executive Summary

Outcomes Research of Preventive Procedures in Unruptured Intracranial Aneurysm

Annually, the diagnosis for unruptured cerebral aneurysms has rapidly increased in Korea and the performance of clipping and coiling treatments for unruptured cerebral aneurysms also have increased annually. The present study was conducted to provide evidence on the management of unruptured cerebral aneurysms through a systematic review of publications related to the disease. The study found out the national status of the disease through an analysis of data acquired by the Korean Health Insurance Review and Assessment Service (HIRA).

Accidental discovery of unruptured cerebral aneurysms has increased due to the development of image scanning techniques and increased interest in health. A proper treatment is recommended for unruptured cerebral aneurysms with symptoms and of large size. But there are still many disputes regarding the management guidelines when the disease without symptoms are accidentally discovered. Although many studies on the rupture rate monitoring the natural progression of the disease and various studies to figure out the complications followed by preventative treatments are currently progressing, there are reports that the results show a difference in the rupture rate by race and region. Therefore, it is necessary to find out the specific characteristics of the disease in Korea.

During the five year period between 2005 and 2009, 63,997 unruptured cerebral aneurysm patients unaccompanied with subarachnoid hemorrhage claimed their health insurance bill with the HIRA. Compared to male patients, female patients took up a large

portion of the bill (64.9%). The mean age of the patients was found to be 58.7-years-old ranging from 50 to 60 years of age. That age range took up more than 50 percent of the total reported disease cases. The outbreak of the disease was reported in 8,586 patients in 2005 and the patient size showed 3.6-fold increase reaching 30,979 patients in 2009.

For the current study, patients were separately reviewed by an observation group without treatment and by treatment group. Then, the treatment group was divided again into a clipping group with surgical treatment and a coiling group with intravascular procedure for the analysis. A systematic literature review on unruptured cerebral aneurysms revealed a reduction in the overall mortality rate when treatments (clipping and coiling) were given compared to the observation group (OR 0.223, CI 0.102-0.489, I2=0). But since the result was obtained only by including observational studies, there was the limitation of low evidence level based on GRADE. Among the observation group, the annual rupture rate ranged about 1.0 percent (0.7-9.2%) and the treatment group reported the development of temporary complications by about 3.8-17.4% along with an outbreak of long term complications by about 2.6-18.0%.

As treatments for unruptured cerebral aneurysms, clipping and coiling surgical procedures were found to have been conducted most frequently. The systematic literature review did not show significant differences between the clipping and coiling in terms of overall mortality rate and in-hospital mortality rate. After surgeries, the hospitalization period was found to have been 4.5 days longer than the coiling group. After coiling, the repeated treatment was reported more frequently. Based on the analysis of the national HIRA data, both treatment procedures were found to have been conducted in similar frequency in Korea. But the coiling procedure was performed more than the clipping surgery from 2006. The clipping surgery was performed on 576 patients in 2005 and the number increased to

1,743 patients in 2009. Coiling surgery was performed on 545 patients in 2005 and the number increased to 1,844 patients in 2009 showing a 3.0-fold increase and a 3.4-fold increase, respectively. In 2006 alone, patients who received the clipping surgery were hospitalized about 8 days longer than patients who received the coiling procedures on average. But the health care payment required for the clipping treatment was about 1.40 million won lower than the cost required for the coiling treatment. Although the treatment method was found to have no significant effect, the annual treatment frequency was found to have an effect to the occurrence of subarachnoidal hemorrhage or death after treatment.

In conclusion, although the diagnosis for unruptured cerebral aneurysm has increased recently, most of the precedent studies on preventative treatments were focused on observational studies showing a lack of evidence. For a natural history of unruptured cerebral aneurysm and proper treatment guidelines for the disease, we need data that consider even the characteristics of cerebral aneurysm. The accumulation of study results based on national data is highly called for.