



CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This thesis is a descriptive study focused on describing and comparing the cost of utilization of 2 alternative treatments which has the same efficacy. The costs those incurred from the utilization included both direct cost and indirect cost.

5.1 Conclusions and Recommendations

- This research tries to understand the situation of rabies immunoglobulin use in Thailand. There are 2 kinds of rabies immunoglobulin available in Thailand (ERIG and HRIG). According to the standard regimen of rabies prophylaxis with rabies immunoglobulin, HRIG is more favorable to be used in every case to avoid the complication from adverse product reaction, but the situation in Thailand is different. Right now, the volume of usage of ERIG is 5 times more than that of HRIG. Although Thailand is still the endemic area of rabies, we cannot afford for HRIG in every case due to both problems of high market price and production potential constrains. As a result, ERIG is still the 1st line regimen for prophylaxis treatment rather than HRIG in Thailand.
- The complications of adverse product reaction from ERIG use can be very minor or even serious to death. However, from the data in this study, the complications were rare and trivial. This may arise from the high purity of the product due to the new technology of production. In spite of that, we still cannot ignore the surveillance of the adverse reaction of ERIG. Or even worse, the problem of the data record distorts the real information of the complication report. That is why the report is lower than it should be.
- The shortage of HRIG occurs in many area of the world, includes Thailand; many international pharmaceutical companies reported that it would rather

be more profit to produce vaccine than to produce immunoglobulin. For example in case of Thailand, the cost of human plasma is very cheap (no payment cost for the donors), but the cost in the process of production is still high and cannot maximize to meet the demand in the country. This cost due to the shortage will aggravate the cost per unit of HRIG much higher than the cost of production alone.

- From the information of rabies immunoglobulin use in the world, there still a lot of shortage of both ERIG and HRIG, but HRIG seems to have much more problem than ERIG. Even in Thailand, if we want to treat the post-exposure cases follow the standard recommendation, TRCS should produce as many as 600,000 to 700,000 vials of ERIG per year. The trend of rabies immunoglobulin use is increasing every year as well as those of neighbor countries. TRCS can use this chance to produce ERIG to the high demand market of rabies immunoglobulin both for domestic use and international use.
- For the other aspect of domestic production of ERIG, this is somewhat like the self-reliance. While Thailand is the endemic of rabies which prevails in many area of the world, Thailand should produce by itself. Especially, when there is the sign of shortage of rabies immunoglobulin. At least, this plant should produce high enough to meet the need in the country. Export is optional. According to the fact that the annual number of deaths worldwide caused by rabies is estimated to be between 40,000 and as high as 70,000 if higher case estimates are used for densely populated countries in Africa and Asia where rabies is endemic. An estimated 10 million people receive post-exposure treatments each year after being exposed to rabies suspect animals.
- The study suggests of using ERIG in Thailand. This suggestion may not valid for long time. At this moment in Thailand, the cost per unit of ERIG is cheaper. And if we look into the price that we pay for HRIG, it poses the question that why Thailand does not invest in HRIG instead of ERIG. The problem of lack of human donors may be the answer for this. But in the

future, we cannot expect for ERIG as well. Nobody knows when the protest of animal rights happens in Thailand. Perhaps Thailand has to invest in HRIG in this near future.

- To avoid the complication after ERIG use, the production plant have to concentrate on purifying the product. The purification process is needed in every quality control. The more purified of the product, the less occurrence of adverse reaction.
- One of the new modalities for post-exposure patients is Monoclonal Antibodies for Rabies. This medication is in the process of study. It is predicted to be used substitute rabies immunoglobulin.

5.2 Limitation of the study

Due to many reasons, this thesis cannot avoid certain limitations. First, there were 2 components of costs, the indirect cost in this study included only cost of income forgone (cost of life loss), cost of rabies occurrence, cost of complication. There is no other aspect of cost such as cost that incurred from the patients and their family e.g. cost of travelling and other expense. It would be more complete to add up more aspect of cost as much as possible, but with time and financing constrain, the study includes only costs that available in secondary data.

Second, the time preference of the analysis is different; the cost of ERIG production is the cost that prospect to happen this year. In spite of that, the cost of HRIG production was derived from the latest available cost which is the cost in year 2000.

Third, the analysis presented in this thesis depends on data available at the national level-secondary data. Some of this data are provisional- there are gaps and inconsistencies. It is about the problem of completeness of secondary data which reflect to the weakness of data system. For example, the report of complication occurrence dues to ERIG use is too low than what we expected. It is expected that more detail and more completeness of the data be available.