



## CHAPTER 5

### DISCUSSIONS , IMPLICATIONS , AND CONCLUSIONS

In this chapter, the results from this study will be discussed and compared to other studies , the policy implications will be described and there will be recommendations about future study.

#### 5.1 Discussions

Because bone marrow transplantation is an operation which is very costly and consumes a lot of limited health care resources , there is little known about the costs of this operation. This study tries to show to health planners and administrators the true cost of BMT, which is an advanced technology. Although there are some limitations according to the restricted data available and limited time for the approach , this study provides the basis for interesting implications and recommendations , and hence a basis of cost analysis of BMT in Thailand.

There are many differences in the studies of cost for BMT which are due to a variety of reasons, for example the rate of cost of personnel and materials, cost of the building and equipment, the costing methods, the cost assumptions, scope of the study and even the exchange rate. So when compared this study to the other studies in developed countries such as the study by Meadows et al (1994) we found that the total cost calculated in this study is much lower, ranging from Bt.417,059 to Bt.1,128,802 while their result ranged from Bt.2,500,000 to Bt.6,250,000 (exchange rate \$1 for Bt.25 ) Even though the cost of BMT in this study seem to be much lower than in other studies in developed countries , for Thailand, this amount of cost seem very high as it is a developing country and its health care budget is limited.

In Thailand, Intragumtornchai et al (1995) reported the average total cost of BMT to be Bt.977,300 for allogeneic BMT , Bt.908,000 for allogeneic PBSTC , and Bt.847,000 for autologous PBSTC which are more than this study's result. This is due to a variety of reasons , e.g. when they estimated the total cost from charge prices of the hospital, they included the administrative cost but no economic allocation criteria , whereas in this study, we used some charge prices when we could not find the unit cost of that service , e.g. laboratory tests, anesthetic in OR , and TPN & lipid nutrition.

1.As the result of the economic crisis in the Asian region, many countries have to adapt their strategies to cope with this problem , so does Thailand. The Thai baht is floated from Bt.25 per \$1 to Bt.40 per \$1 at present time, so this must affect the cost of drugs and increase the retail prices , adding 25% to the cost of drugs. Because the largest amount of BMT cost is drug costs ( 63.27%) so the cost of BMT is absolutely higher. Not only the drug cost will be higher , but also the cost of equipment and materials , so affecting the total cost of BMT as well.

2.The average length of stay in this study equals 46 days and its range is 25 to 126 days. How long the patients have to stay in hospital depends on how severe are their complications. The more of complications, the longer of length of stay which will make a higher total cost of BMT. From the Statistic Department , Chulalongkorn Hospital , the average length of stay in hospital in general is only 11 days so we can see that BMT's hospitalization time is much longer than the hospital's average. In order to reduce the cost of BMT ,there must be less complications and the best way is to undertake the autologous transplantation and/or PBSTC

3. In this study , it seems that there was little equity in accessibility of the BMT as most of the transplanted patients were from Bangkok (42.50%) and the second most came from the central region (31.25%).

In each health insurance scheme , there are differences in reimbursement rate, health benefits and criteria. For example, the Social security scheme is limited by the maximum payment for Bt. 600,000 , the Civil servant medical scheme is not limited in the amount of money but limited in some categories such as drug items. For the Low income people, they have no ability to pay for such a expensive BMT so the hospital has to give free services for them and thus incurred all of the costs. As Chulalongkorn Hospital has established the Bone Marrow Transplantation Program as a research program and this program can serve patients who have no ability to pay for the medical expenditure up to 10 cases per year so it is not a true representative of financing of the patients. However , in real practice , we do not know whether all people get equity in accessibility of BMT.

4. For the cost components in this study, the capital costs were small , only 8.87% of the total cost, because some of the equipment and building costs were already included in the recurrent costs used as the charge costs of those services , e.g. laboratory tests and radiology investigation. In recurrent costs which account for 91.13% of the total cost, the material costs were the largest proportion (80.84%) and we found that there was 10 – 20 % wastage of supplies because of the incomplete data collection. Thus we have to add 15% to the costs of the supplies as a requirement of the hospital administrators.

5. In this study, we examined only the costs since the day of admission to the day of discharge and follow up for 6 months so the costs of screening which occurred before admission were not included. After the patients received screening for HLA type I or II , they had to wait for the matched HLA typing from the

donors, this process may take time, around a couple of months or more, and moreover, some patients cannot receive BMT because they cannot find the matched donor. Therefore, the hospital may lose resources without any outcome if the patients received screening tests already but cannot find the matched donor. There should be some criteria for screening in BMT service and criteria for selecting the suitable patients in order to get BMT service so that the resources would be used more efficiently.

## 5.2 Policy Implications

The ultimate benefit of cost analysis is to be a guideline for the health planners and administrators. Cost information of BMT in this study could be used in ways such as the following :

- To propose to the policy makers to negotiate with the Social Security Office to give more health benefits to the insured persons in case of BMT and consider whether the current rate of reimbursement for BMT (Bt. 600,000 per case) is appropriate.
- Promoting health insurance especially for the hematologic disorder as it is a catastrophic illness so health insurance is the best way to cope with it by decreasing and sharing the risk of burden in health expenditure for this illness. And educating people more about hematologic disorders so that they know what is the first choice of treatment to cure this severe disease, namely BMT, a technologically complicated procedure, where can they get this health care service, and how to behave if this illness occurred to any of their family's members.
- Establish a Marrow Donation Center, there were many of the hematologic patients who could not undertake BMT because there was no matched HLA

typing for them so they had to go on suffering with their illness. If there was the Marrow Donation Center, that patients might have a greater chance to get matched HLA typing and can survive for several years.

For Chulalongkorn Hospital, the cost information for BMT in Hematologic disorder could be used as follows :

- With limited resources, the hospital has to provide health care services in response to the increasing demand for health care services each year, especially BMT, very high cost so the hospital administrators can use this cost information to plan for the number of transplantation procedures so that the hospital can manage to set the transplantation to be done within the limited budget, can adjust resource requirements for the delivery of the services and adjust a reasonable charge for the BMT. It would be more efficient in using resources utilization and providing health care services in hospital.
- According to this study, the capital cost is very high and there were only 80 patients in 1991 - 1997 who underwent BMT. As a result, it may indicate that the number of the patients is not large enough to absorb the capital cost or in the other words, it does not have economy of scale. To solve this problem, they have to collaborate with other hospitals for referring the patients who need BMT. As Chulalongkorn Hospital is considered to be the most potential referred center in Bangkok or even in Thailand, in order to become Bone marrow transplantation Center, the human resource department in Bone marrow transplant Unit has to be more properly organized. At this present of time, there is only one expert in BMT and 22 staff working in this unit, so better established human resource planning to get more expertise staff to join a BMT team is considered as an important issue.

- About the module of service delivery, a more effective system of post-operation management has to be introduced. In Chulalongkorn Hospital, the patients have to come to the hospital for follow up for at least 6 months after discharge. This is not convenient for them, because of their poor health status. In the United States of America, there is an efficient service delivery of post-operation management for BMT patients such as Home visiting and educating the patients' s relative about how to take care the transplanted patients at home. So it would be very useful if Chulalongkorn Hospital can develop a proper service delivery.

### 5.3 Recommendations for Future Study

1.As this study is a retrospective design and has many limitations so it is better to do cost analysis in prospective design as the researcher can design more carefully about data collection of costs so that they can get the more accurate results.

2.This study examined only direct provider costs since the day of admission to the day of discharge and follow up for 6 months. Actually ,costs are incurred not only in hospital , but outside as well. Patients and their families have to bear a big burden too , for example , they have to stay in hospital for a long time , so have to quit work, and even after discharge from the hospital ,the patients still cannot work. So it is important to study the costs incurred by the patients and families.

3.As BMT is a highly technical procedure that requires extensive hospitalization, it is very expensive , and many patients cannot afford the high expenditure , so it is necessary to study about the options for relieving the financial burden associated with BMT. For example , the Social security scheme , the Civil servant medical scheme , and private insurance can be valuable resources in planning for these financial

needs. In the United States of America, there are Government programs like Medicaid, for people of low income and Social Security for insured persons which can provide financial assistance for health expenses and disability. So it is very interesting to promote all Thai people to have at least one health benefit scheme especially for the catastrophic illness like Severe hematologic disorder as its treatment, BMT, is very expensive.

4. BMT is the first choice of treatment in severe hematologic disorder such as aplastic anemia, non-hodgkin's lymphoma, etc. because it gives the most satisfying result when compared with the other treatments (Intragumtornchai, 1995) so it is obvious that there are many research developments of BMT procedure in Thailand now. Even though BMT gives the good result of treatment, it is a technically complicated procedure and has many complications. The transplanted patients have to stay in hospital for at least 1-2 months in the intensive care room and they have to take antibiotics and blood until their new marrow/stem cells can work. After discharge, they have to keep on taking drugs and cannot work as usual for 6 months and probably have long term complications such as infection, graft versus host disease, etc.. So it cannot be said that the patient will have a better life after BMT. It is important to study the quality of life of the patients undergoing BMT because as mentioned before, BMT is very expensive so they wonder whether it is worthwhile to pay a lot of money to BMT or not.

#### **5.4 Conclusions**

This study tries to develop a methodology of cost analysis of bone marrow transplantation in hematologic disorders at Chulalongkorn Hospital. It is the retrospective determination of direct provider costs from individual medical records. The costs were collected from many relevant departments in Chulalongkorn Hospital. The total provider cost of BMT from the day of admission to the day of discharge

and follow up for 6 months averaged Bt.645,535 per patient. Cost per Intermediate effectiveness averaged Bt.821,590 and cost per full effectiveness averaged Bt.1,063,234. The costs were classified by inputs as capital costs and recurrent costs. There was 8.87% of total cost for capital cost and the recurrent cost was 91.13%, which can be classified into 2 components: the material costs (80.84%) and personnel costs (19.16%). In material costs, the drug cost was highest (63.27%), the second was blood cost (10.13%). The important implication of this study is how the hospital would cope with the high cost of catastrophic illness among hematologic disorders. This study provided a basis for Social Security Office to consider the rate of appropriate reimbursement in bone marrow transplantation.