UNIVERSITI TEKNOLOGI MARA

EVALUATING THE EXPRESSION OF UBIQUITIN B GENE IN THE BRAIN OF GESTATIONAL DIABETES MELLITUS RATS

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Dissertation submitted in partial fulfilment of the requirements for the Bachelor of Pharmacy (Hons.)

Faculty of Pharmacy

JULY 2016

ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to my supervisor Dr Cini Mathew John and my co-supervisor, Dr Fazlin Mohd Fauzi for all the guidance, support and time throughout the processes of completing the thesis. My appreciation also goes to Dr Cini's master student, Miss Intan Saidah and Miss Siti Hajar, who also had helped me a lot in conducting this project and sharing their knowledge and experiences.

Most importantly to my parents who always give me moral support and motivation through my ups and downs. Without their help, I don't know whether I can cope with all the challenges and difficulties that I've experienced throughout conducting this project. Last but not least would be my friends who were there for me and keep me strong throughout this project.

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ABSTRACT

Some women experienced glucose intolerance during their pregnancy, which is known as gestational diabetes mellitus (GDM). The mechanism that causes the condition remain unclear but certain studies claims that this is due to production of several hormones produced by placenta as GDM fades after delivery. Classically, glucose homeostasis and insulin are commonly associated with pancreas but recent studies showed that brain also involves in this metabolic system. Thus, this study intended to see another side of glucose mechanism, which involves the brain. Gene of polyubiquitin B (UBB) is evaluated in the brain to understand the involvement of the ubiquitin system in the glucose homeostasis. UBB is a component of the Ubiquitin (Ub) which tags the protein substrate. Ubiquitin system is crucial for turnover of protein and protection against neuronal injury. Thus, through this study, understanding of involvement of UBB that vital for Ub level regulation in the brain towards glucose homeostasis can be achieved. Animal model of GDM and normal are prepared and at 21st day of gestation, the rats are sacrificed to collect their brain. The brain underwent RNA isolation and RT-PCR to evaluate UBB expression. The result showed that there is significant down regulation of UBB gene in GDM compared to normal rats. This condition may affect the Ubiquitin system in the brain region that leads to disruption in the normal metabolic mechanism including GDM.

CHAPTER 1

INTRODUCTION

Gestational diabetes mellitus (GDM) is the glucose intolerance effect observed at the onset of pregnancy. The real causes of GDM are still unknown but there are some claims that GDM is caused by the hormones produced during pregnancy that block the action of the mother's insulin (Barbour et al., 2007). Placenta which is the source of nutrients for the baby as it grows also produces several hormones such as oestrogen, cortisol and human placenta lactogen that block the effects of insulin. These hormones lead to the condition referred to as insulin resistance. The fact that after delivery the insulin resistance fades become the strongest evidence to this claim (Buchanan & Xiang, 2005). The consequence of insulin resistance is that the mother may need up to three times the normal amount of insulin as it is difficult for her body to utilize insulin (Barbour et al., 2007). As the pregnancy progress and placenta become bigger, insulin resistance develops further. To combat this situation, additional insulin is produced by the pancreas, but it is still insufficient to overcome the blocking effects of placenta hormones, hence gestational diabetes develops. Similarly, resistance may result from the combination of increased maternal adiposity and production of insulin-desensitizing effects of hormones by the placenta (Buchanan, Xiang, Kjos, & Watanabe, 2007). Placenta produces human placental lactogen (HPL) or also known as human chorionic somatomammotropic (HCS) which is similar to the growth hormone that helps the baby to grow and modifies the