Umbilical Cord Blood Collection Technique and Risk of Bacterial Contamination

Thesis

Submitted for the partial fulfillment of
Master degree in pediatric medicine
By

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2014

ACKNOWLEDGMENT

First, I thank **"Allah"** for granting me the power to accomplish this work.

Words do fail when I come to express my deepest thanks, profound appreciation and gratitude to ***Prof. Dr.*** **Sahar Hassanein,** Professor of Pediatrics, Ain Shams University, for giving me the privilege of working under her supervision and for her generous help, kind encouragement and support.

Special thanks to ***Prof. DR*** **Mohamed Hassan Nasreldin** , Professor of Obstetrics and Gynecology, Ain Shams University, for his assistance and very helpful advice and for his encouragement and facilitations to do this work in The Materinty Hospital of Ain Shams.

Also special and great thanks to ***Dr.*** **Kholood Wagdy Ziada** Lecturer of Medical Microbiology & Immunology ,Ain Shams for her kind help, support and advice.

Sincere appreciation and gratitude are conveyed to ***Dr.*** **Rania Ibrahim** Assistant professor of Pediatrics, Ain Shams University, for her kind supervision, constant

guidance and effort to fulfill this work, she really taught me how to write a thesis.

I can't forget to thank ***Prof DR*** **Mourad Tadaros** ,head of pediatric department,Ghamra hospital , who lead and encourage me to do this study.

I would like to thank the mothers who let me to collect their cord blood .

Last but not least, I like to thank my beloved parents , brothers , sisters and special thanks to my kind wife for their persistent assistance , praying , kind care , help. They are the candle of my life.

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LIST OF ABBREVIATIONS

- **AFP** :Alpha-fetoprotein
- **Baso** :Basophils
- **BMT** :bone marrow transplantation
- **CBC** : Complete blood count
- **CBEs** : Cord blood derived embryonic-like stem cells
- **CD** :The cluster of differentiation
- **CS** : Caesarean Section
- **DM** : Diabetes Mellitus
- **Esino** : Esinophils
- **GA** :Gestational age
- **GB VIRUS C:** Hepatitis G virus
- **GRAN** : Granulocytes
- **GVHD** :Graft-versus-host disease
- **Hb** :Hemoglobin
- **HBV** :Hepatitis B Virus
- **hCG** :Human chorionic gonadotropin
- **HCT** :Hematocrit
- **HCV** :Hepatitis C Virus
- **HIV** : Human immunodeficiency virus
- **HLA** : Human leukocyte antigen

- **HPC** : Hemopiotic cell
- **HSCs :** Hematopoietic stem cells
- **HTLV** :Human T-cell lymphotrophic virus
- **HTN:** Hypertension
- **IgG:** Immunoglobulin G
- **IVC:** Inferior vena cava
- **Lymph**: Lymphocytes
- **MCH:** Mean Corpuscular Hemoglobin
- **MCHC:** Mean Corpuscular Hemoglobin Concentration
- **MCV:** Mean Corpusclar Volume,
- **MID**: Minimum Inhibitory Dilution ,
- **Mono:** Monocytes
- **MS**Cs: Mesenchymal stem cells
- **NANOG:** Embryonic stem cell-associated protein 4
- **NVD:** Normal vaginal delivery
- **O.F.C:** occiptofrontal circumference
- **OCT4:** octamer-binding transcription factor
- **PDW** :Platelet Distribution Width.
- **PLT** : Platelet ,
- **RDW** :Red cell Distribution Width
- **SD** :STANDARD deviation
- **SHOT:** Serious Hazards of Transfusion
- **SSEA** :State-specific embryonic antigens

- **SVC:** Superior vena cava
- **TLC** :Total leukocytic count
- **TNC** : Total nucleated count
- **TRA1:**Tumor rejection antigens
- **TTI:** Transfusion-transmitted infections
- **UCB** Umbilical cord blood
- **UCBT** :Umbilical cord blood transplantation
- **UV:** Ultrviolet
- **VD:** Vaginal Delivery
- **VSELs:** Very small embryonic-like stem cells
- **WNV** :West Nile virus
- **Wt:** Weight

INTRODUCTION

In the last 20 years, umbilical cord blood (CB) that had previously been discarded as medical waste has increasingly become a viable stem cell source for hematopoietic progenitor cell (HPC) transplantation. The advantages of cryopreserved CB such as rapid availability, lower risk of graft versus host disease, and, most importantly, numerous potential donors, make it an attractive alternative to bone marrow (BM)**)(Roh et al.,2014)**

Blood centres worldwide now collect and store UCB after the delivery of a baby upon the parents' request. However, one problem associated with UCB is that its collection is a one- time possibility and the amount of blood that can be collected is limited using conventional ways of blood collection, which include syringe-assisted and gravity-assisted methods **(Bertolini et al., 1995)**.

There have been several reports on alarming levels of bacterial contamination in stored blood bags from different surveys conducted in sub Saharan Africa. According to these

investigations bacteria were cultured in 8 to 17% of stored blood units **(*Hassall et al.*, 2009)**.

Significant bacterial contamination of blood units may be the result of any or of the following : Inadequate disinfection of venipuncture site, improper sampling or manipulation of blood units by opening and interrupting the sterile bag-tubing close system, or higher than allowed storage temperature **(*Opoku-Okrah ,2009)*.**

AIM OF WORK

The purpose of this study is to clarify the impact of technique of umbilical cord blood collection on amount and bacterial contamination of the collected blood.