Effect of Orally Administered Probiotics on Incidence and Severity of Necrotizing Enterocolitis in Very Low Birth Weight Preterms

Thesis

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List of Abbreviations

Bifido	:	Bifidobacteria
BMI	:	Body mass index
BW	:	Birth weight
C. difficile	:	Clostridium difficile.
CBC	:	Complete blood count
CFU	:	Colony Forming Unit.
CRP	:	C reactive protein
CVC	:	Central venous catheter
DNA	:	Deoxyribonucleic acid.
DWMI	:	Diffuse white matter injury
E. coli	:	Escherichia coli
ELBW	:	Extremely low birth weight
FAO	:	Food and Agriculture Organization of the United Nations
GA	:	Gestational age,
GI	:	Gastrointestinal

GIT	:	Gastrointestinal tract
GMH-IVH	:	Germinal matrix intraventricular haemorrhage

List of Abbreviations (Cont..)

H. pylori	:	Helicobacter pylori
Hb	:	Haemoglobin
IgA	:	Immunoglobulin(A)
IgE	:	Immunoglobulin(E)
IVH	:	Intraventricular hemorrhage
Lac	:	Lactobacilli
LBW	:	Low birth weight
LGG	:	Lactobacillus rhamnosus GG.
NBS	:	New ballard score
NEC	:	Necrotizing enterocolitis.
NICUs	:	Neonatal intensive care units
NO	:	Nitric oxide
PAf	:	Platelet activating factor
PDA	:	Patent ductus arteriosus
PGs	:	Prostaglandins

Ph	:	Power of hydrogen ion
PHI	:	Periventricular haemorrhagic infarction
PMA	:	Postmenstrual age

List of Abbreviations (Cont..)

PROM	:	Premature rupture of membranes
PVL	:	Periventricular leukomalacia
RBC	:	Red blood cells
RDS	:	Respiratory distress syndrome
ROP	:	Retinopathy of prematurity
S. aureus	:	Staphylococcus aureus
SBS	:	Short bowel syndrome
SD	:	Standard deviation
Th1	:	Type 1 helper cells.
Th2	:	Type 2 helper cells.
UAC	:	Umbilical artery catheter
VLBW	:	Very low birth weight
WHO	:	World Health Organization

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بسم الله الرحمن الرحيم

INTRODUCTION

Necrotizing Enterocolitis (NEC) is one of the most catastrophic gastrointestinal emergencies in very low birth weight (VLBW) premature infants, affecting, 7% to 14% of these infants ***(Hintz et al., 2005)***.

NEC is a leading cause of death and morbidity in NICUs, and the incidence of NEC has not changed in the past 20 years ***(Fanaroff et al., 2003)***.

The precise etiology of NEC is unknown, but it is widely considered a multifactorial disease; prematurity, enteral feeding, intestinal hypoxia, ischemia, and bacterial colonization are considered major risk factors ***(Caplan et al., 2005)***.

It has been suggested that an inappropriate, accentuated, inflammatory response to colonizing pathogenic florae in the premature gastrointestinal tract plays a major role in the initiation of NEC ***(Claud and Walker, 2001)***.

The inflammatory cascade promotes the spread of bacteria or toxin, resulting in ischemia, necrosis, and in some cases, perforation ***(Markel et al., 2006)***.

Probiotic bacteria are defined as live microbial supplements that colonise the gut while providing benefits to the host. The benefits of probiotics such as Bifidobacteria, and Lactobacilli include changes in intestinal permeability, enhanced mucosal IgA responses, and increased production of anti-inflammatory cytokines ***(Millar et al., 2003).***

In vitro evidence showed that pathogenic florae attach to the epithelial cells of preterm infants much more easily than to those of term infants, and studies indicated that commensal bacteria could inhibit or reduce inflammatory signaling in intestinal epithelia ***(Neish et al., 2000)***.

These data suggest that probiotics, by modifying the occurrence of these cascades of events, may play a major role in reducing the incidence of NEC ***(Walker et al., 2002)***.

AIM OF THE WORK

The aim of the present study is to assess the effect of probiotics in the form of bifidobacteria and lactobacilli, fed to VLBW preterm infants on incidence and severity of NEC.

Chapter (1):

Probiotics

The term probiotic was derived from the Greek word meaning “for life”. The Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) have stated that there is adequate scientific evidence to indicate that there is potential for probiotic foods to provide health benefits and that specific strains are safe for human use ***(FAO and WHO, 2001)***.

Concept of probiotics:

The term probiotic was introduced into the scientific literature in the 1965 by Stillwell and Lilly. A widely accepted definition of probiotics is "live microbial food ingredients that are beneficial to health". However, the scientific basis of this definition has recently been questioned since animal studies suggest that some probiotic effects can be achieved by non_viable bacteria and even by isolated bacterial DNA. Therefore, probiotics have recently been defined as ‘microbial cell preparations or components of microbial cells that have a beneficial effect on the health and well being of the host’ ***(Salminen et al., 1999).***