شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

Effect of Magnesium Sulfate "$MgSO_4$" Therapy in Preterm Deliveries, Bolus versus Bolus and Infusion Protocols on Apgar score: Randomized Clinical Trial (RCT)

Thesis

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Waleed Tarek Abdelrahman Sarhan

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List of Abbreviations

Abb.	Full term
ACOG	*American College of Obstetricians and Gynecologists*
AF	*Amniotic fluid*
ALT	*Alanine transaminase*
APHge	*Ante-partum hemorrhage*
AST	*Aspartate aminotransferase*
BMI	*Body mass index*
C.P	*Cerebral palsy*
CAI	*Chorioamnionitis*
CAP	*Contractile-associated proteins*
CAPs	*Contraction associated proteins*
CCBs	*Calcium channel blockers*
Creat	*Creatinine*
CRH	*Corticotrophin releasing hormone*
CS	*Cesarean section*
DBP	*Diastolic blood pressure*
DM	*Diabetes mellitus*
FIRS	*Fetal inflammatory response syndrome*
GBS	*Group B streptococcus*
Hb	*Hemoglobin*
Hellp $	*Hemolysis elevated liver enzymes low platelet syndrome*
HS	*Highly significant*
HTN	*Hypertension*
IM	*Intramuscular*
IUGR	*Intrauterine growth retardation*
IV	*Intravenous*
IVHge	*Intra ventricular hemorrhage*
Mgso4	*Magnesium Sulfate*
MMP	*Matrix metalloprotease*
NA	*Not applicable*

List of Abbreviations (cont...)

Abb.	Full term
NEC	*Necrotizing enterocolitis*
NF-κB	*Nuclear factor-κB*
NMDA	*N-methyl- D –aspartate*
NS	*Non significant*
NSAIDs	*Nonsteroid anti-inflammatory drugs*
PG	*Prostaglandins*
PGE2	*Prostaglandin E2*
PGs	*Prostaglandins*
PPROM	*Preterm premature rupture of membranes*
PR	*Progesterone receptor*
PROM	*Premature rupture of membrane*
PTLHx	*Preterm labor history*
RDS	*Respiratory distress syndrome*
ROM	*Rupture of membranes*
ROS	*Reactive oxygen species*
S	*Significant*
SBP	*Systolic blood pressure*
STBM	*Syncytiotrophoblast membrane*
VOCC	*Voltage-operated calcium channels*
WBCs	*White blood cells*

INTRODUCTION

Preterm birth can be considered a complex problem in relation to baby's development to the parents' practical and emotional experience and to mother child interaction. The poor developmental outcomes of preterm infants have been well documented ***(Ionio et al., 2017)***.

Protection of the immature brain of premature infants constitutes a crucial challenge for obstetricians and neonatologists ***(Chollat et al., 2017)***.

Preterm birth is a risk factor for cerebral palsy (C.P.), a condition characterized by abnormal control of movement and posture that results in limitation of activity ***(Horton et al., 2015)***.

Although the survival of premature infants is continuously improving, their neurological outcome remains a major concern, as preterm birth is associated with neuro-developmental impairments such as neuromotor deficits, cognitive deficits, learning disabilities, behavioral and psychiatric disorders and neurosensory deficiencies ***(Chollat et al., 2017)***.

Currently, one third of cases of cerebral palsy (C.P.) are associated with early preterm birth ***(Horton et al., 2015)***.

Almost 40% of individuals with C.P. were born preterm and the risk of C.P. increases with decreasing gestational age ***(Chollat et al., 2017)***.

Although survival rates of babies born preterm have risen, there has been no parallel fall in neuro-developmental impairment rates, especially among babies born very preterm at < 32 weeks' gestation ***(De Silva et al., 2018)***.

Magnesium is an ionized mineral essential to hundreds of enzymatic processes, including hormone receptor binding, energy metabolism, muscle contractility as well as neuronal and neurotransmitter function ***(Lingam and Robertson, 2018)***.

It is primarily an intracellular cation, and stores are distributed between bone (53%), muscle (27%), and soft tissue (19%). Serum magnesium levels are tightly controlled (0.65–1.05 mmol/L), and homeostasis is maintained through intestinal absorption, storage in bones, and renal excretion ***(Lingam and Robertson, 2018).***

Magnesium has an inhibitory effect at neuronal synapses, leading to its use as an anticonvulsant, particularly in eclamptic seizures ***(Lingam and Robertson, 2018)***.

Magnesium sulfate "Mgso4" is involved in many intracellular processes, acting to induce cerebral vasodilatation, reduce inflammatory cytokines and oxygen free radicals, and inhibit calcium influx into cells. Animal studies have shown

that it has a neuroprotective effect and that it may also interact with antenatal steroids to preserve the integrity of the blood-brain barrier in neuroinflammation ***(Bouet et al., 2015).***

Three major randomized clinical trials suggest that magnesium sulfate administered before an anticipated early preterm birth reduces the risks of cerebral palsy in surviving infants. In March 2010, the American College of Obstetricians and Gynecologists (ACOG) and Society for Maternal Fetal Medicine released a joint clinical opinion stating that the available evidence suggests that magnesium sulfate is a fetal neuroprotectant ***(Horton et al., 2015)***.

There is strong evidence to support antenatal magnesium Sulphate ($MgSO_4$) infusion in order to prevent CP in context of prematurity. Based on animal and human observational studies that demonstrated a neuroprotective effect of $MgSO_4$ ***(Chollat et al., 2017)***.

Sixty-three women had to be treated in order to prevent CP in one child (95% CI 43 to 155). However, no statistically significant effect on infantile mortality was observed. In the light of these convincing results, several national authorities (USA, Australia and New Zealand, Canada, UK, Belgium and Ireland) have recommended antenatal administration of $MgSO_4$ in women at imminent risk of very preterm birth in order to prevent cerebral palsy ***(Chollat et al., 2017)***.