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Study the association of visfatin in the pathogenesis of meconium stained amniotic fluid in labour

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Abstract

Meconium staining of the amniotic fluid and the meconium aspiration syndrome (MAS will likely remain common occurrences faced by health care providers. Unfortunately, our understanding of these entities is incomplete. There are a number of issues which need to be adequately evaluated regarding the pathophysiology of MAS. The objectives of this study is to investigate the association of visfatin in the pathogenesis of meconium stain amniotic fluid. A case control study, conducted in Al-Zahra teaching hospital/AL-Najaf city where 90 women delivered studied, 45 with meconium stained amniotic fluid (MSAF) and 45 clear amniotic fluid (CAF) where study from first of March 2013 to July 2013 in the labour room and operative theater, data collected regarding their names, gestational age, sex, type of the meconium, mode of delivery, outcome and parity of the mother. Aspiration of blood done and the concentration of visfatin in amniotic fluid were determined using a specific and sensitive enzyme immunoassay. We concluded that, the level of visfatin is increased significantly in MSAF in comparison with the CAF group.

Keywords: Visfatin; Meconium aspiration syndrome; Amniotic fluid; Labour

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Introduction

Meconium stained amniotic fluid is a common finding in labour, particularly in the term and post-term pregnancy, the mechanism for its occurrence is still complex and unknown, but there are many theories attributed to its pathophysiology [1, 2]. The most

important consequence of meconium-stained amniotic fluid (MSAF) is meconium aspiration syndrome (MAS), and at least 5% of infants born through MSAF develop MAS.

MAS continues to be a threat to many newborns throughout the world, with a case fatality rate of 5% (as much as 40%), in addition to short- and long-term pulmonary and neurodevelopmental sequelae [3]. Pathophysiology of meconium aspiration syndrome (MAS) is complex and interactions between individual pathomechanisms are still not completely understood [4]. As recently shown, inflammation plays a significant role in the pathogenesis of MAS. Activated cells release and stimulate production of a wide variety of mediators, including cytokines, enzymes, reactive species, and other biologically active substances in meconium-injured lungs.

Anti-inflammatory drugs acting on different levels of inflammatory cascade may in combination with other treatment (exogenous surfactant, inhaled NO, liquid ventilation) improve the clinical status of newborns with MAS. For example, corticosteroids modulate activity of phospholipase A2 and induced NO synthase, influence migration and activation of leukocytes, and reduce lung edema. Cyclooxygenase inhibitors modulate production of thromboxane and prostaglandins. Phosphodiesterase inhibitors have vasodilation, bronchodilation and anti-inflammatory effects. Antioxidants diminish formation of reactive species.

However, there are many other drugs, e.g. anti-cytokine antibodies, inhibitors of complement, inhibitors of angiotensin converting enzyme, anticoagulants, inhibitors of proteolytic enzymes, calcium-channel blockers etc. that may be beneficial in MAS [5]. Visfatin is (52KDa) a cytokine that has been identified as a growth factor for early B cell, termed pre-B cell colony enhancing factor, It is expressed in visceral fat intuitively expressed in myometrium, placenta, all layer of human fetal membrane [6] and it is anti–apoptotic for both amniotic epithelial and mesenchymal cell and neutrophils [7]. Collectively these finding suggest that vifatin play role in inflammatory process in regulation of other pro inflammatory cytokines and in the preservation of immune cell [8]. In this paper we want to study the association between visfatin and MSAF.

Method and material

A case control study of 90 cases of a women presented in labor who meconium had stained amniotic fluid and those with clear amniotic fluid it was carried out between

March 2013 to July 2013 in the labour room and operative theater in AL-Zahraa Teaching Hospital in AL-Najaf city. During study cases keeping in mind the inclusion and exclusion criteria. Ethical approval was obtained from Kufa University in Al- Najaf city and a written consent was obtained from all qualified pregnant women volunteers after explaining the purpose of the study and the confidentiality of collected date and results.

Inclusion criteria

All pregnant women in labour with cephalic presentation, singleton pregnancy, with clear or meconium stained liquor irrespective of age, parity and stage of labour. Artificial rupture of membranes or spontaneous rupture of membranes, those with previous normal deliveries or previous lower section caesarean section.

Exclusion criteria

The presence of any sort of infection, mal-presentation, multiple pregnancies, pre maternal medical diseases, fetal malformation, intrauterine fetal demise and post-term pregnancy.

Biochemical Investigation

Blood samples was collected from participating women for complete blood picture, blood sugar, renal and liver function test and serum for visfatin level.

Statistics

Statistical analysis was done by using SPSS (statistical package for social sciences version 20). In which we use independent sample T-test for measurement data and chi square (X2) test for categorical data. P-value <0.05 as significant.

Results

The result of our study which consist of 45 with meconium stained amniotic fluid and 45 clear amniotic fluid. The median of number of para for both groups was one. The comparison of certain parameters between the two groups were shown in (Table 1).

Parameter	Meconium stained AF N=45	Clear AF N=45	P value
	Mean ±SD	Mean ±SD	
Age(years)	25.8±4.14	26.13±3.92	0.983
GOT(U/L)	22.33±4.07	23.97±5.65	0.117
GPT(U/L)	25.04±5.77	27.3±8.89	0.541
B. urea(mg/dl)	22.6±4.78	24.3±6.81	0.758
Serum creatinine(mg/dl)	0.71±0.22	0.72±0.31	0.919

Table 1.

Comparison between meconium stained and clear amniotic fluid groups.

No significant difference between the two groups regarding age, gestational age, SGOT, SGPT, B. urea and serum creatinine.

Gestational age (weeks)	Number	Percentage
37-38	15	33.33
39-40	23	51.11
41-42	7	15.56

Table 2.

Relationship between gestational age and MSAF.

This table shows that gestational age of 39- 42 weeks constitute 66, 67% of MSAF women

Mode of delivery	Number	Percentage
C/S	31	68.9
Vaginal delivery	14	31.1

Table 3.

Relationship between mode of delivery and MSAF

In this table the percentage of caesarean delivery was 68.9% which is higher than that of vaginal delivery.

Parameter	Meconium stained AF N=45	Clear AF N=45	P value
	Mean ±SD	Mean ±SD	
Visfatin level	59.04±12.09	40.12±15.43	<0.001

Table 4.
Comparison of visfatin level between MSAF and clear AF.
There is significant increment in visfatin level between MSAF and clear AF.
(P<0.05).

Discussion

Meconium-stained amniotic fluid is commonly found in obstetrics: it occurs in 9-20% of deliveries. Meconium passage into the amniotic fluid may be an antepartum or intrapartum event [9]. Meconium aspiration syndrome (MAS) remains one of the most common causes of neonatal respiratory distress and there were a number of unresolved controversies concerning these issues [10]. In our study the MSAF women age between 20- 30 years constitute 82.3%, The primigravidas constitute 60% of them, their gestational age of 39- 42 weeks constitute 66, 67%, and the percentage of caesarean delivery was 68.9% which is higher than that of vaginal delivery. Oyelese et al [11] concluded that the rising incidence of meconium-stained amniotic fluid with gestational age is consistent with the hypothesis that fetal maturation is a major etiologic factor in meconium passage. Sedaghatian et al [12], this study showed that the risk of MSAF increased with higher GA, Alexander GR [13] was found an increased risk of MSAF for advancing gestational age, indicators of fetal stress. P Swain et al [14] and Basima Sh. [2] reports that MSAF are associated with higher incidence of LSCS & higher gestational weeks.

In this study we found that the level of visfatin is increased significantly in MSAF in comparison with the CAF group, we found no similar study, which needs further studies on a large number of women, but Rao et al [15] found that The incidence of MSAF was significantly higher in the group with acute chorioamnionitis/funisitis and

he concluded that the incidence of MSAF and neonatal morbidity is higher in the presence of acute inflammation of placental membranes. The presence of meconium in the amniotic fluid should alert the physician to the potential for infection and increased neonatal morbidity.

In conclusion, the level of visfatin is increased significantly in MSAF in comparison with the CAF group and further studies are needed on a large number of women.

Competing interests

The authors declare that there is no conflict of interest.

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