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Barbosa A[1], Piculo F[1], Marini G[1], Vesentini G[1], Morceli G[1], Damasceno D[1], Prudencio C[1], Pinheiro F[1], Hiiaz A[2], Rudge M[1]

1. *UNESP,* ***2.*** *Case Western Reserve University*

SERUM CONCENTRATION OF THE CCL7 CHEMOKINE IN DIABETIC PREGNANT WOMEN DURING PREGNANCY UNTIL THE POSTPARTUM PERIOD

Hypothesis / aims of study

In the light of the complex inter-relationship between gestational diabetes mellitus (GDM), urinary incontinence (UI) and recovery mechanisms, we hypothesized that CCL7 chemokine response to childbirth injury will be likely absent or compromised in the natural repair process of diabetic pregnant women plus UI. This could negatively impacts inherent reparative mechanisms and delay/prevent the migration of MSCs to the site of injury caused by childbirth, with consequences in the postpartum period. The aim of this study was to investigate the CCL7 levels profile in diabetic pregnant women with urinary incontinence during pregnancy over the first year postpartum.

Study design, materials and methods

This cross-sectional study was conducted in a tertiary hospital, and was approved by the Research Ethics Committee of the Institution (CAAE: 20639813.0.0000.5411). The diagnosis of GDM was established between 24th and 28th gestational weeks, by the 75 g-OGTT test according to ADA's criteria (1). Urinary incontinence was defined according to the International Continence Society (2) and the CCL7 levels was measured by ELISA (R&D Systems, Catalog Number DCC700). Two hundred twelve women were classified into four study groups: normoglycemic continent (NC), normoglycemic incontinent (NI), diabetic continent (DC) and diabetic incontinent (DI), and they were evaluated at six-time-points: 12-18, 24-28 and 34-38 gestational weeks, 24-48 hours, 6 weeks and 6-12 months postpartum.

Results

At 12-18 weeks, it was possible to consider only two groups, continent and incontinent, because at this early gestational period has not yet been the diagnosis of gestational diabetes. The group with GDM and UI (DI group) showed lower levels of CCL7 in all time points during pregnancy and postpartum, compared to normoglycemic groups (NC and NI), indicating that these women have not recovered from child birth induced UI during the 6-12 months postpartum in comparison to their controls, and that the progression of UI and/or lack of recovery throughout the first postpartum year can be related with lower levels of CCL7. Instead, serum CCL7 was significantly increased in the NC group.

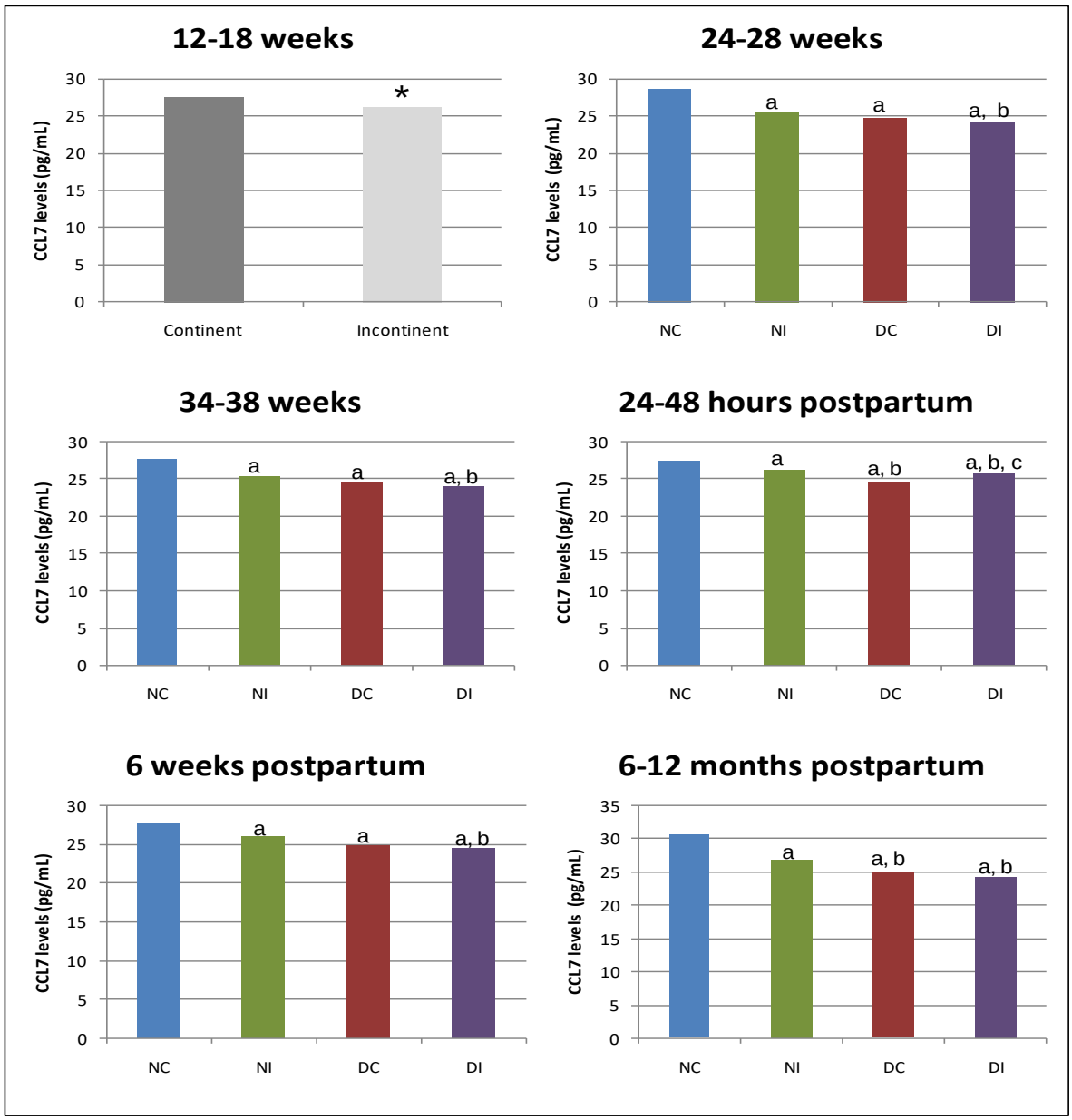

Figure 1. Serum CCL7 levels in diabetic and normoglycemic, continent and incontinent women during pregnancy and postpartum. All analyses were done using SAS software for Windows (v.9.3, SAS Institute Inc., Cary, NC, USA).
* $p < 0.05$ – compared to continent group (t test).
[a] $p < 0.05$ – compared to NC group (t test).
[b] $p < 0.05$ – compared to NI group (t test).
[c] $p < 0.05$ – compared to HC group (t test).

Interpretation of results

Taken together, these findings of overexpression of CCL7 in the serum of NC group and decreased levels in the DI group, could confirm that diabetes delays the recovery from child birth induced UI (3), and that CCL7 could potentially be used as a serum marker of injury.

Concluding message

This study demonstrates lower levels of CCL7 in the DI group during pregnancy and postpartum and suggests that the progression of UI in diabetic women and/or lack of recovery throughout the first postpartum year can be related with low levels of CCL7. This provides a translational potential where CCL7 measurement could be used as a surrogate for injury after delivery. Successful controlled CCL7 mediated stem cell homing to the lower urinary tract could one day introduce the potential for non-operative treatment or prevention of stress urinary incontinence.

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Disclosures

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