

Phosphorylated-HSP27 (P-HSP27) protein expression decreased in placentas of labouring women

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Background:

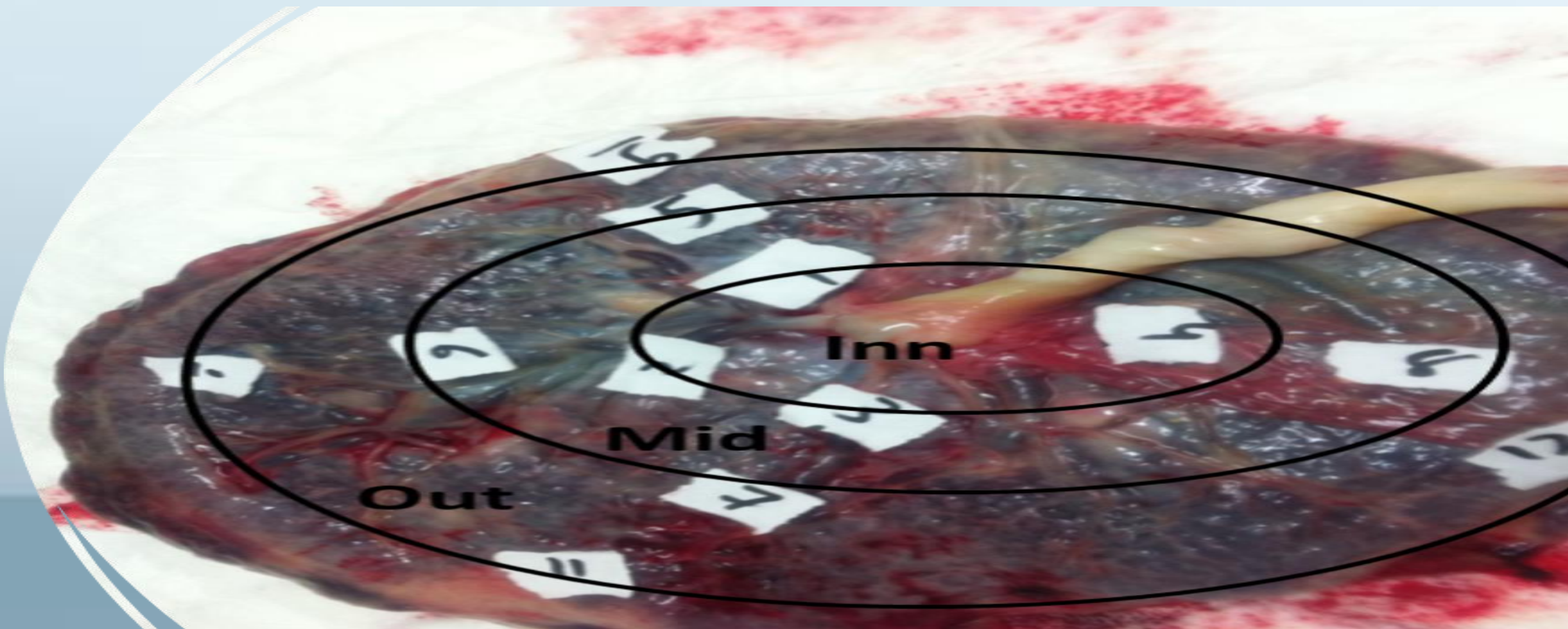
Placenta oxidative stress is a feature of human labour. Heat shock proteins (HSPs) play a key role in regulation cytoskeletal stability, protein folding and prevention of apoptosis in different cells.

HSPs can be induced in cells as a protective mechanism to cope with cellular stress. Cellular functions of HSP27 are controlled by phosphorylation of HSP27 (P-HSP27) at three Serine sites (ser 15, 78 and 82).

Objective:

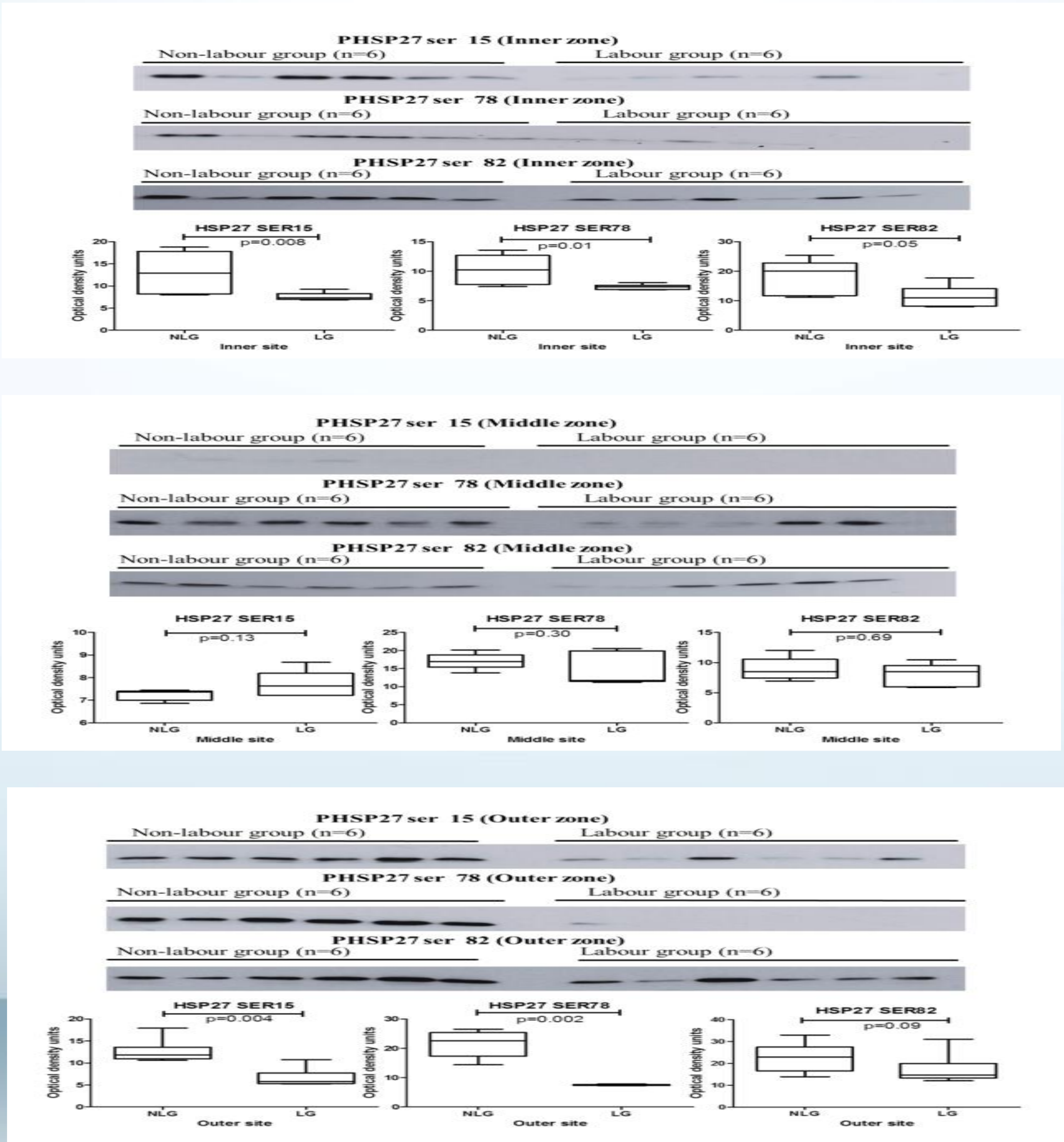
We hypothesized that placental expression of P-HSP27 (ser 15, 78 and 82) would be altered during labour compared to non-labour placentas

Design and Methods:



Laboratory based experimental studies.

Samples were obtained from 12 sites within each placenta. Equally spaced apart pieces were sampled from inner, middle and outer zones (from cord insertion point) in labour group (vaginal delivery) (n=6) and non-labour group (Caesarean Section delivery) (n=6). Patients were matched for gestational age. P-HSP27 (ser 15, 78 and 82) protein expressions were investigated by Western Blot analysis.



Figures representative images of Western blot showing P-HSP27 at ser 15 (upper panel), ser 78 (middle panel) and ser 82 (lower panel) expression in the inner, middle and outer placental zones in non-labour and labour groups(n=6 in each group). The graphs show the box and whiskers analysis of the blots. Comparison between zones was performed using Mann-Whitney analysis. NLG (non-labour group) and LG (labour group).

Results:

There was a significant decrease in P- HSP27 expression in the labour group when compared to the non-labour group at the inner zone for all P-HSP27 at ser 15, 78 and 82 (p= 0.008,p=0.01, p=0.05 respectively). There was no significant difference in P-HSP27 expression at the middle zone. There was a highly significant decrease in P-HSP27 expression in the labour group when compared to the non-labour group at the outer zone for P-HSP27 at ser15 and ser 78 (p=0.004, p=0.002 respectively). There was no significant difference in P-HSP27 at ser 82 at the outer zone (p=0.09).

Discussion:

The explanation for less P-HSP27 protein expression in labour group that may perhaps to allow labour to progress and the placenta to detach as a repair mechanisms. To our knowledge this is the first study to show a decrease in P=HSP27 associated with an increase in placental apoptosis during labour. This study suggests a role for P-HSP27 in placental trophoblast apoptosis during labour. However, we chose to study P-HSP27 for two reasons. First, because P-HSP27 is involved in the control of apoptosis and is expressed in trophoblast cells. Second as labour is pro-inflammatory condition and is characterized by high level of apoptosis.

Conclusion:

Again these findings further emphasize that without careful sampling methods differences between study samples can be missed.