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# Inflammatory response in radiation induced late effects

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The aim of this study was to analyse the response of the immune system in the inflammatory reactions in patients with late skin injuries after

- Radiotherapy
- Interventional fluoroscopy procedures.

The expression of :

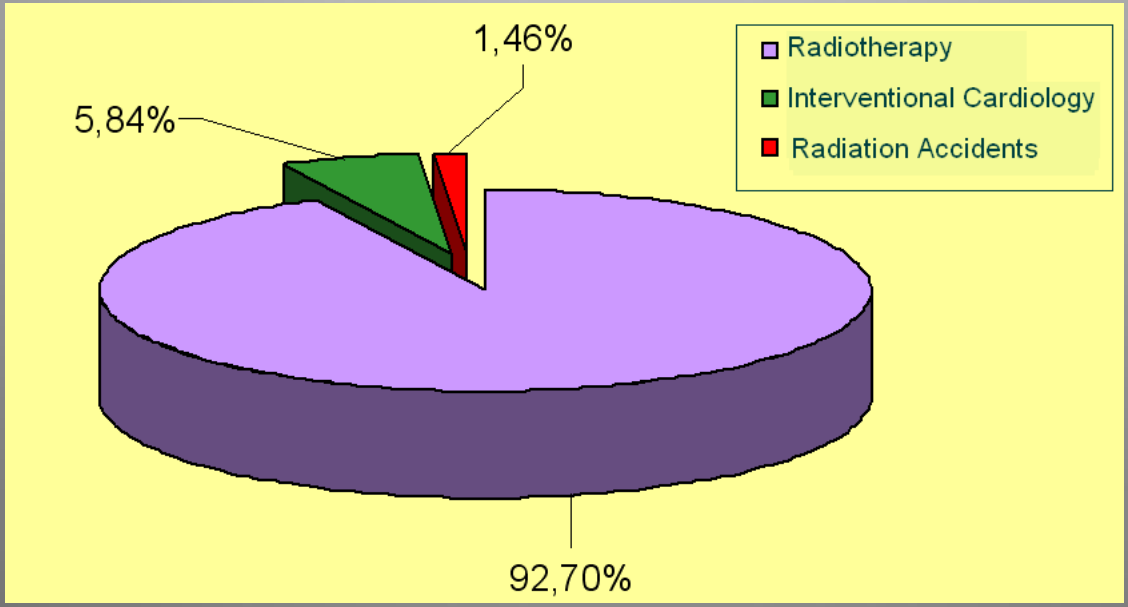
- ICAM1
- β1-integrin on granulocytes and lymphocytes
- C-reactive protein
- T lymphocytes subpopupations

The recruitment of leukocytes from circulating blood is decisive in the inflammatory reaction.

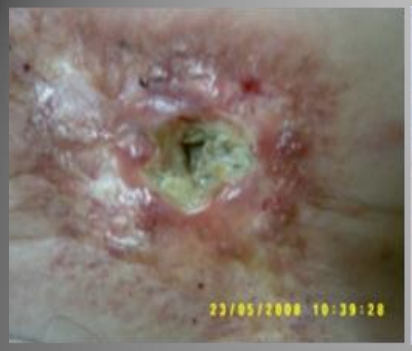
- All the steps in the recruitment cascade are orchestrated
- by cell-adhesion molecules (CAMs) on both leukocytes and endothelial cells,
- and different subsets of CAMs are responsible for different steps in extravasation.

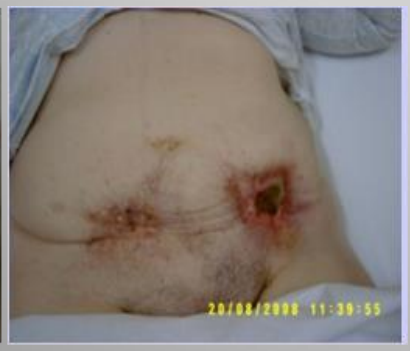
From 1997 to 2011 over 160 patients were referred to the Radiopathology Committee of Burn Hospital for the diagnosis and therapy of C. R. S.

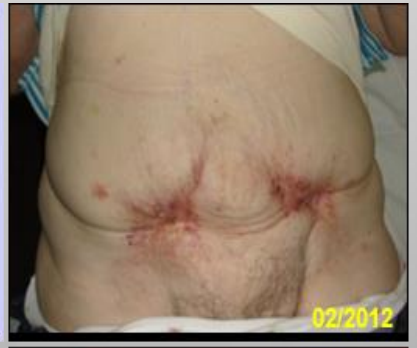
Distribution by aetiology of patients treated at Burns Hospital, period 1997-2011, N= 166

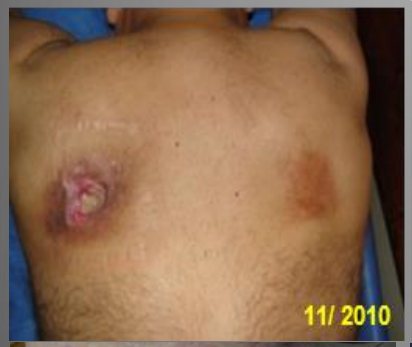


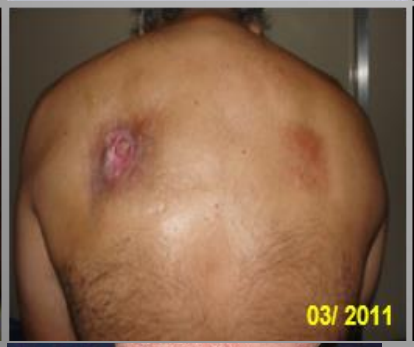

- The follow up of 21 patients that showed late cutaneous reactions graded according to the RTOG / EORTC system is reported here.
- Median age (ranges): 63 (49-79) years.
- Late effect was considered from three month after the radiation procedure.

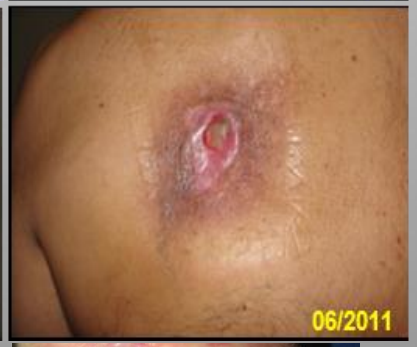


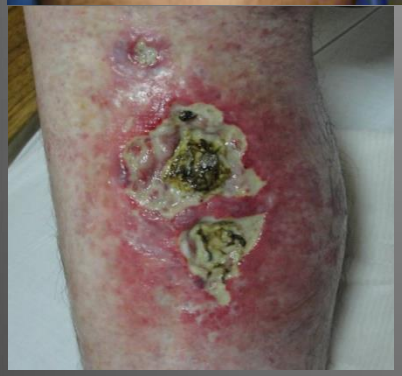



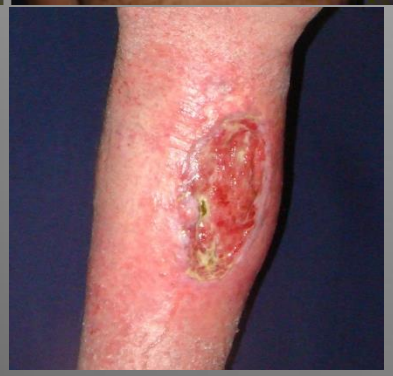



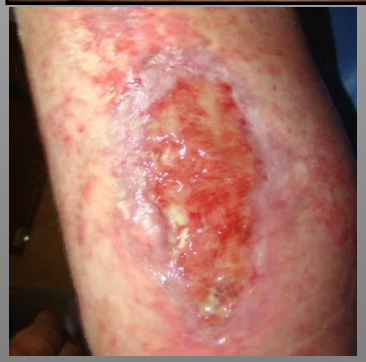



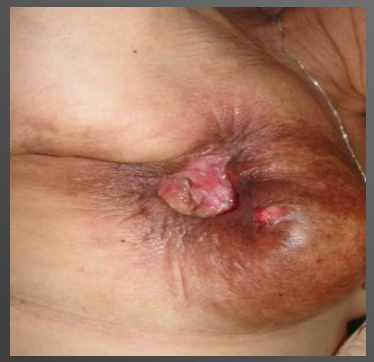



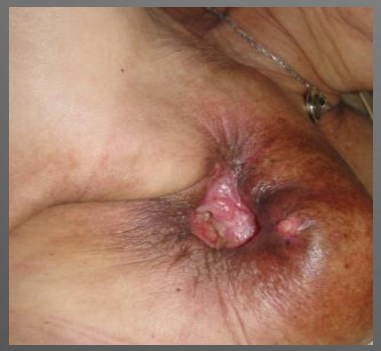



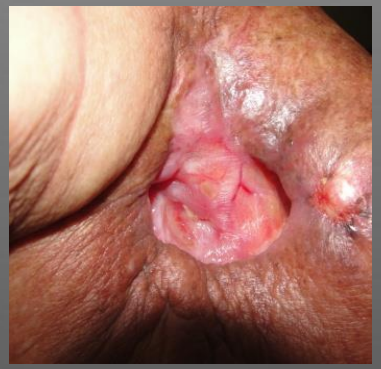













Patient A underwent Rt for Ovarian cancer during mid 70s. Cyclical evolution with Exacerbation crisis from 2000 up to now

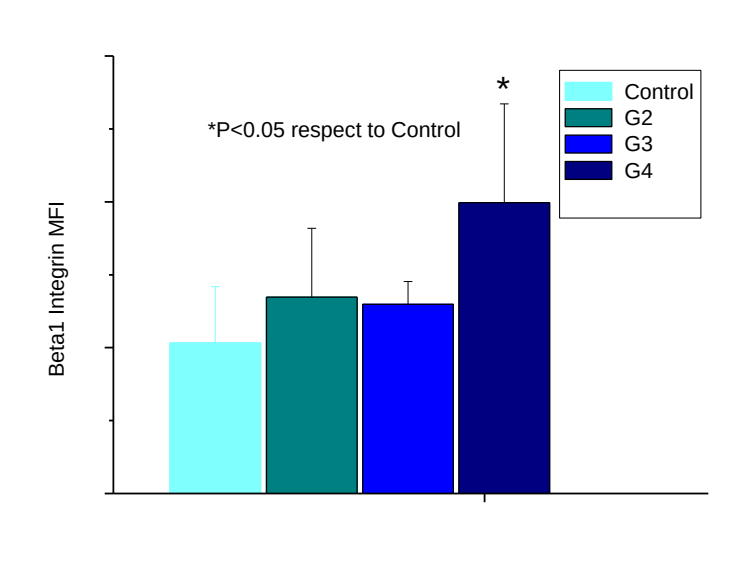
Patient B Rt for Thymoma in 1984, presented at Burns Hospital in 2010 with an important back pain and later ulceration since 2008.

Patient C Rt for Angioma forty years ago. Admitted at BH in 2011 with recurrent ulcer.

Patient E Rt following breast cancer ( 2009) with good evolution

# Results

The analysis of adhesion molecule expression by flow citometry revealed **a higher expression of β1 Integrin on gated lymphocytes of Grade IV** patients compared to non exposed controls

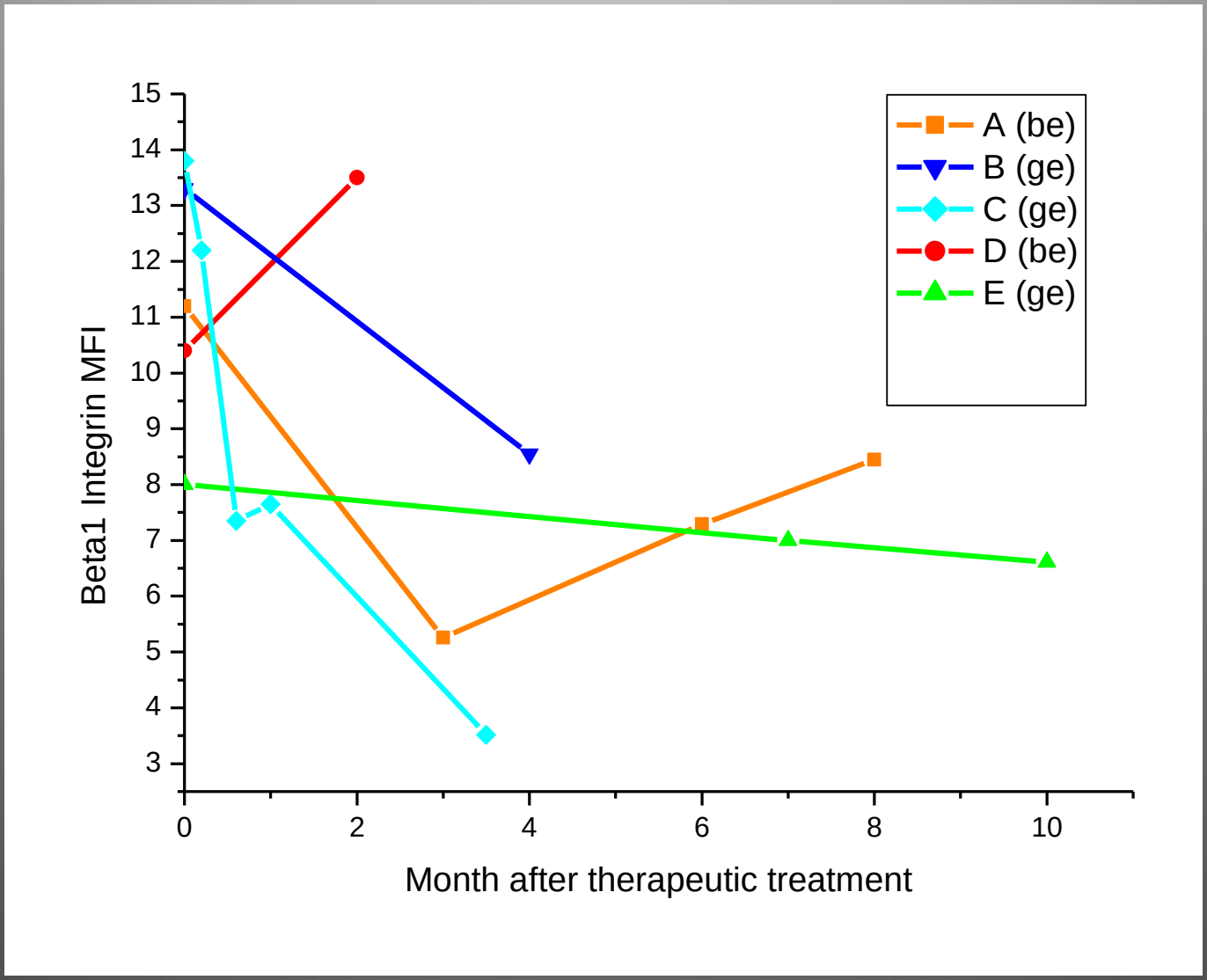



A **decrease** in its expression value, was also noted in the follow up of patients with **good response** to therapeutic treatment

There were no significant changes in the expression of ICAM1, lymphocytes or granulocytes.

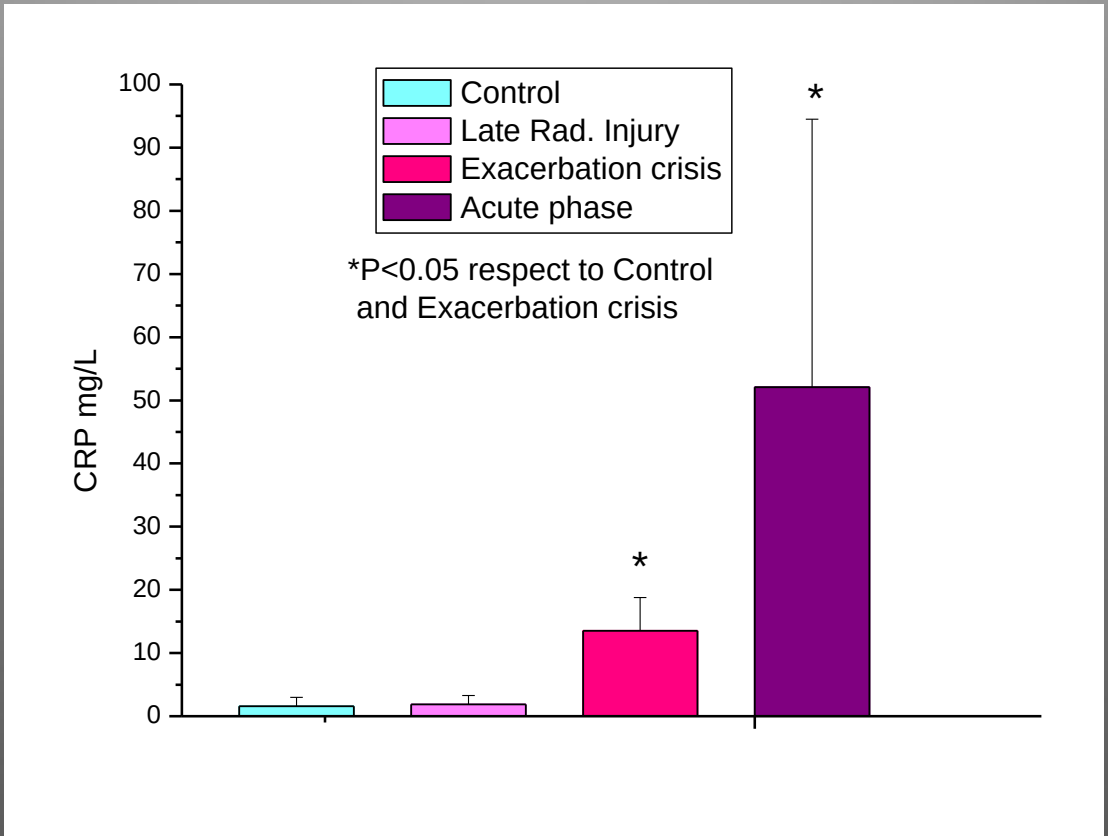
# Changes in β1 Integrin expression on gated lymphocytes of some patients as response to medical treatment.

- be: bad evolution
- ge: good evolution

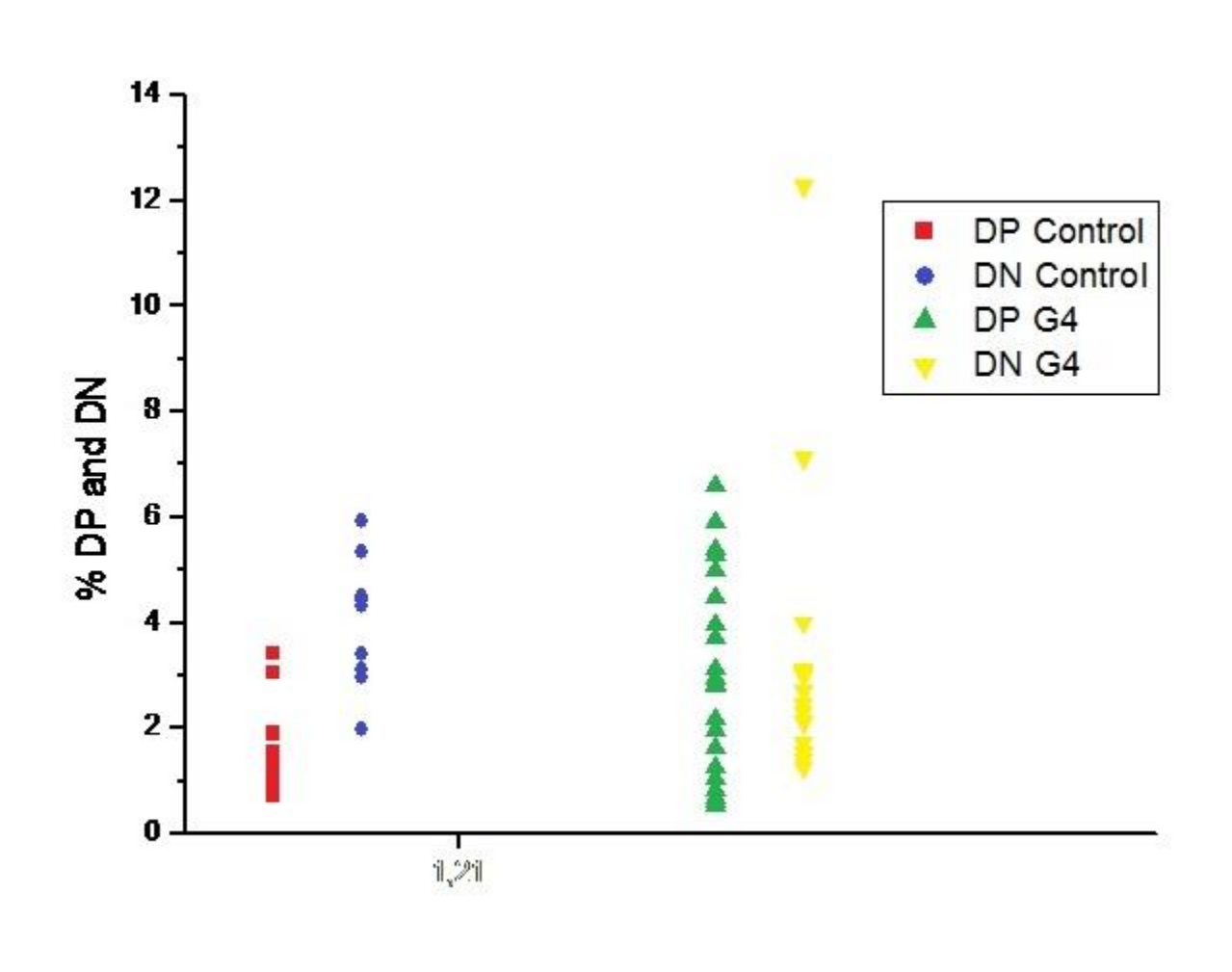


# C-reactive protein

Patients in acute phase :52,1±47.4mg/l
Patients with late toxicity  in exacerbation crisis :13.5± 5.3mg/l
Patients with late radiation injury :1.9± 1.4mg/l.



Percentage of Double Positive and Double Negative thymic precursors in G4 patients and control sample



# Conclusions

We analized the adhesion molecules because:

- The β1 Integrin is the major integrin expressed on resting T and B lymphocytes whereas ICAM1 mediates both lymphocyte and monocyte adhesion but its expression is regulated on endothelial cells

- We noted increased β1 Integrin expression on gated lymphocytes of patients that showed late cutaneous reactions graded 4 according to the RTOG / EORTC system and it had good correlation with the patient evolution.

- We have observed a disturbance in the T cell homeostasis

The present findings showed that the parameters analysed, which require confirmation in a larger study , in combination with other inflammatory indicators *could be used* as potential follow-up markers of the chronic radio-induced inflammation process and its response to therapeutic treatments.

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