

EFFICACY OF COUPLED PLASMA FILTRATION ADSORPTION (CPFA) IN REDUCING BILIRUBIN LEVELS A CASE SERIES

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INTRODUCTION

Persistent hyperbilirubinemia has been identified to be toxic for the mitochondria with alterations of glycogen metabolism. Moreover it interferes with cell-mediated immunity and hemostatic process. These modifications can lead to hepatocytes dysfunction and alteration of the gastrointestinal barrier, with an increase of circulating endotoxin [1]. All these factors together may decrease patient tolerance to anesthesia and surgery, so that the operative risks are increased. Moreover preoperative hyperbilirubinemia is considered to be a negative predictor for post-operative complications and survival. There are not specific medical therapies for hyperbilirubinemia, only aphaeretic treatment [2]. CPFA (Coupled Plasma Filtration Adsorption) is an extracorporeal therapy that uses plasma filtration associated with an adsorbent cartridge and hemofiltration to remove cytokines and inflammatory mediators associated with septic shock, severe sepsis, and multiple organ dysfunction syndrome. CPFA reduces also bilirubin, with a few published results [3-4].

METHODS

We performed 34 CPFA treatments, from February 2014 to December 2016, on a 10 consecutive patients (9M/1F), admitted at Surgery Unit of our hospital. Eligibility of the patient for CPFA treatment was serum total bilirubin level exceeding 15 mg/dL. The average number of treatment per patients was 3. Each session varies from 180 to 480 minutes (median 360 minutes) with fixed blood flow of 150 ml/min and 15% of Plasma fraction.

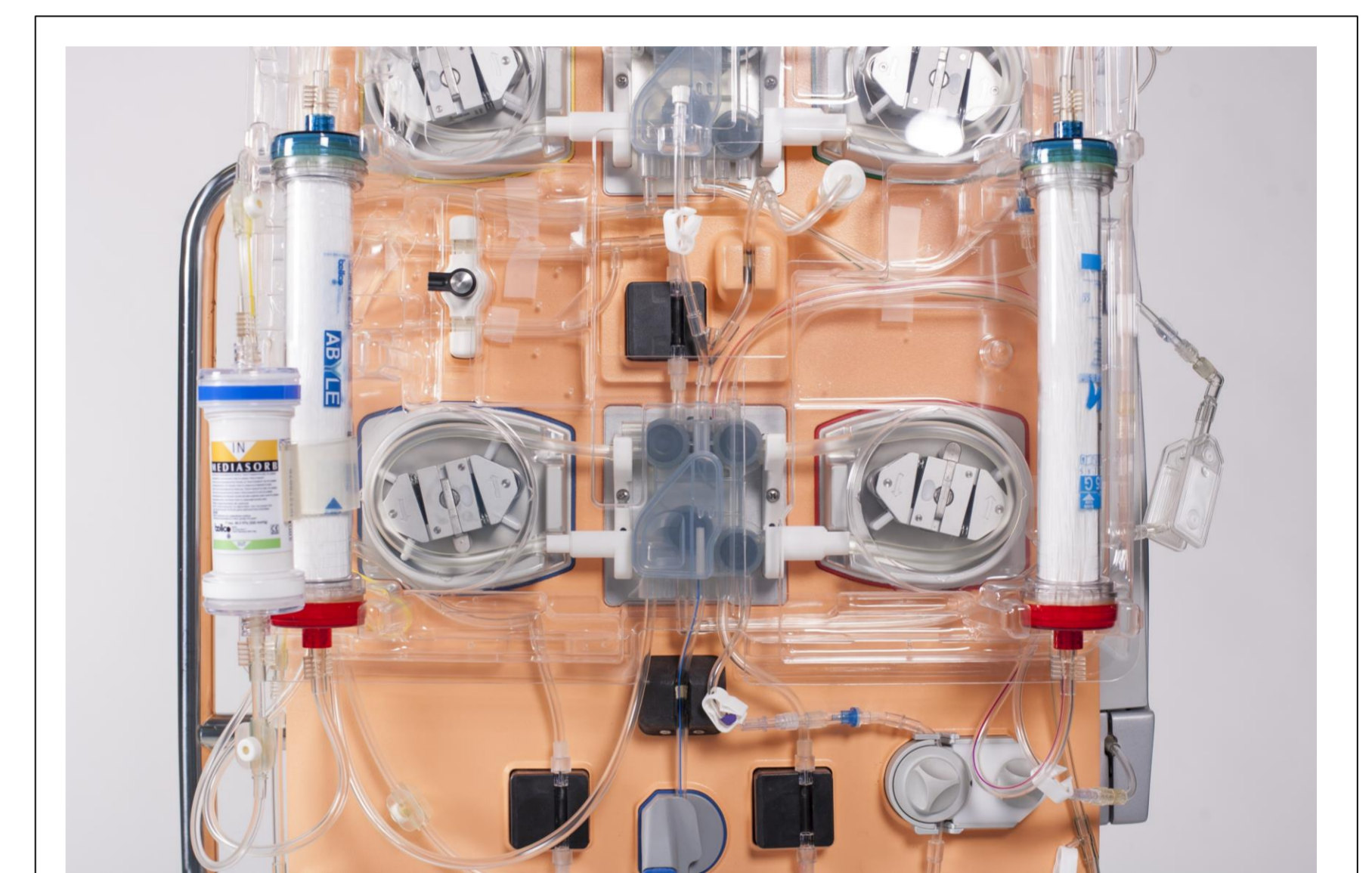


Fig 1: CPFA therapy; plasma passes through a sorbent cartridge containing 140 mL of hydrophobic styrene resin (MEDIASORB; Bellco Srl, Mirandola, Italy) constituted by numerous pores and channels that add to its extensive surface area.

RESULTS

The average volume of plasma treated was $6,4 \pm 1,6$ L/session while the mean total serum bilirubin value pre-treatment was $19,0 \pm 9,1$ mg/dL. After each CPFA session, statistically significant reduction has been observed from the total serum bilirubin ($13,8 \pm 5,7$ mg/dL; $P < 0,0001$ – FIG 2), with an average Bilirubin removal of: $(26,2 \pm 7,9)$ %.

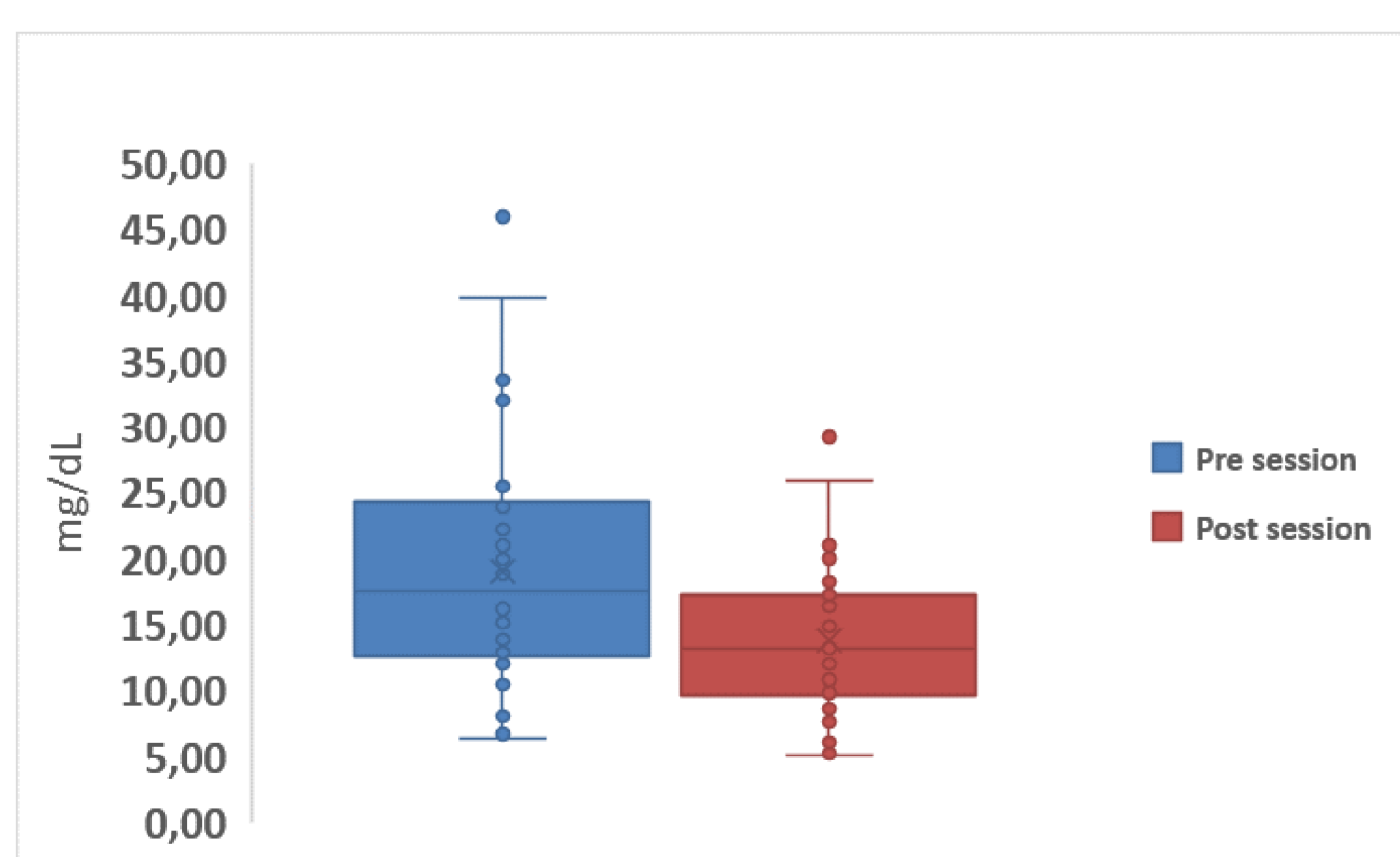


Fig 2: Total Bilirubin levels pre and post session

Gender:	9M – 1F
Average number of treatment per patient	3
CPFA treatment time (min):	325 ± 81
Volume of Plasma treated (L)	$6,4 \pm 1,6$
Bilirubin average removal (%)	$26,2 \pm 7,9$
Average total bilirubin pre session (mg/dL)	$19,0 \pm 9,1$
Average total bilirubin post session (mg/dL)	$13,8 \pm 5,7$

Table 1: Patients and treatment characteristics

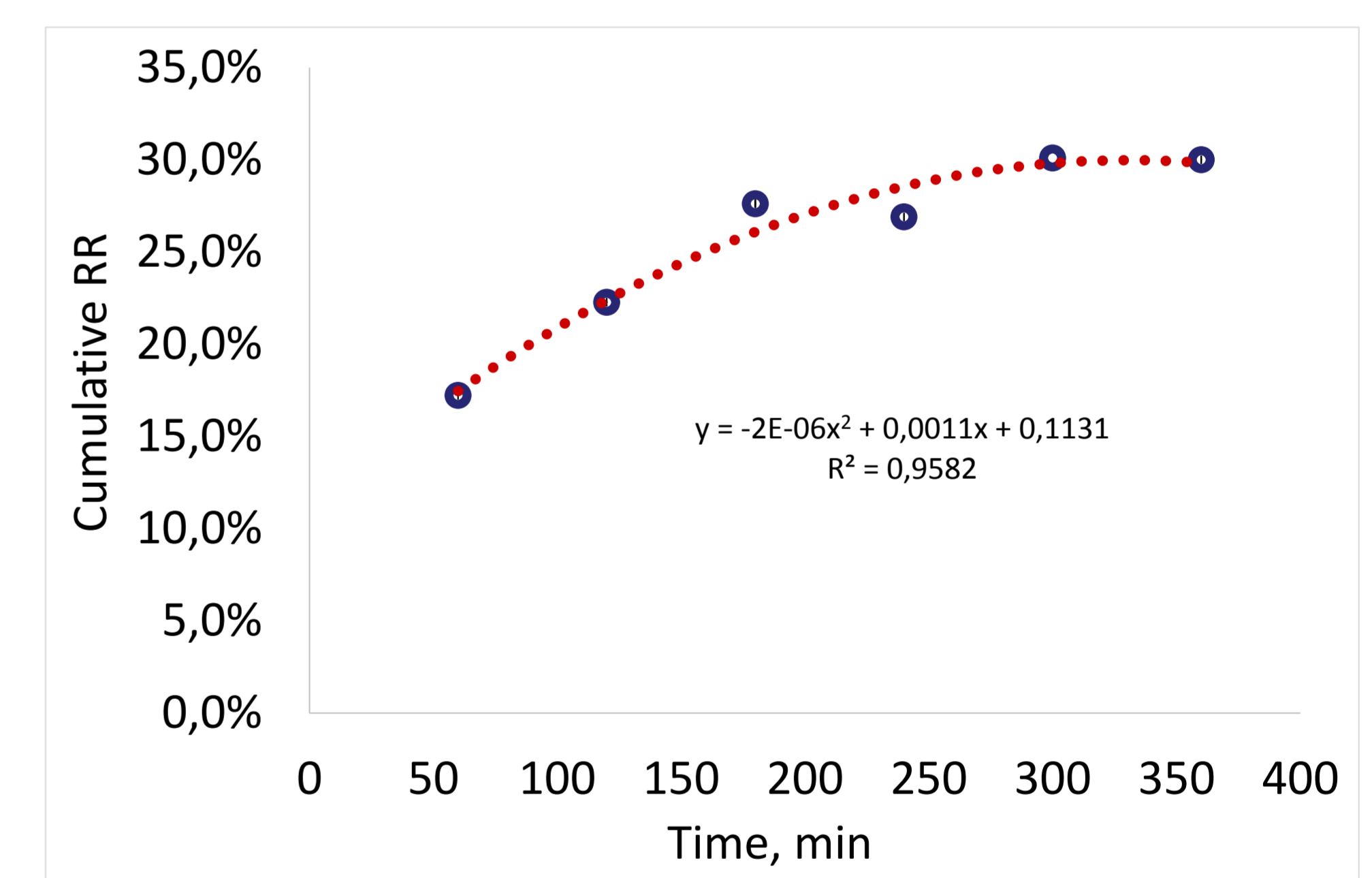


Fig 3: Kinetics study: Reduction ratio vs time

Analysis of average cumulative reduction ratio (RR%) have been done using data coming from different sessions on different patients. In figure 3 are reported the average reduction ratio versus time. A plateau of 30% seems reached in 350 minute of treatment.

CONCLUSIONS

CPFA seems to be an effective treatment for hyperbilirubinemia. Generally, one third serum concentration reduction could be achieved per session. CPFA could be considered as possible alternative for the treatment of patient with hyperbilirubinemia.

REFERENCES

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