

Bouskill VN<sup>1,2</sup>, Kumar R<sup>1</sup>, Craik A, Whitney K<sup>1</sup>, Zhang C<sup>1</sup>, Schneiderman JE<sup>3</sup>, Carcao MD<sup>1</sup>.

<sup>1</sup>Department of Paediatrics, Division of Haematology/Oncology and <sup>2</sup>Department of Nursing, The Hospital for Sick Children, Toronto, Canada; <sup>3</sup>Physiology and Experimental Medicine, SickKids Research Institute

## INTRODUCTION

- Stress, exercise and desmopressin (DDAVP) all cause the release of VWF and FVIII from sites of storage into the blood stream.
- In persons with hemophilia A or type 1 VWD, DDAVP may be used to treat or prevent bleeds.
- We have recently undertaken an exercise study (12 -15 minutes of 85% predicted maximum heart rate on a stationary cycle ergometer) on 30 boys (ages: 5 -18 years) with severe, moderate or mild hemophilia A or B to determine the hemostatic changes that occur with exercise.
- We report here the response to exercise in boys with mild and moderate hemophilia A and compare this to their historic responses to DDAVP by retrospective chart review.

## RESULTS

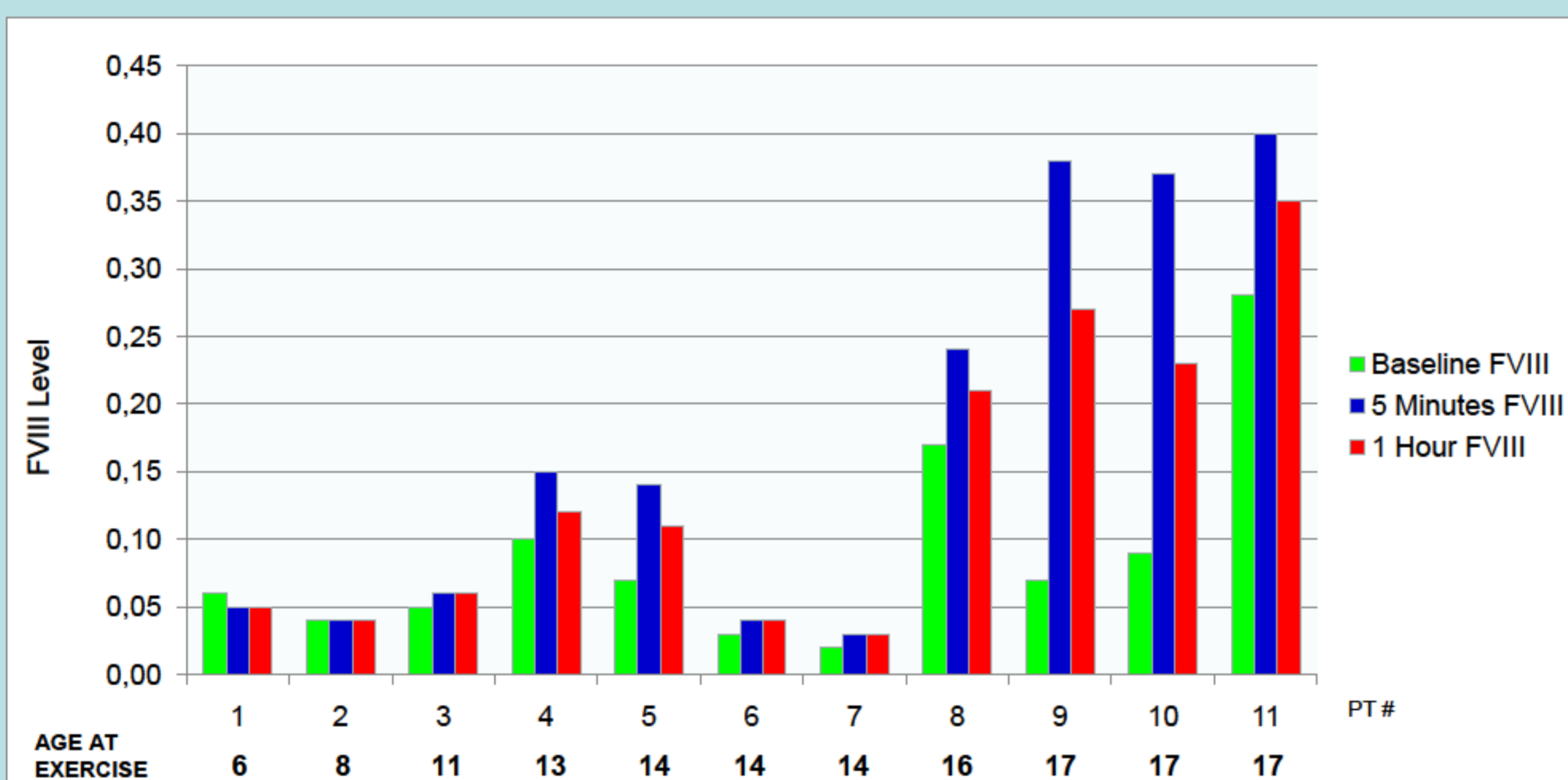
- 30 boys participated in the SickKids Exercise study
  - 13 had mild/moderate hemophilia A.
  - 11 of 13 had previously undergone DDAVP challenges.

Age At	Mean Years (± SD)
DDAVP Challenge	5.8 (± 4.3)
Exercise Study Participation	12.8 (± 3.7)

- Mean baseline FVIII in these boys was 7.9% (± 4.4%).

- Increase in FVIII levels was significantly higher with the DDAVP challenge at 1 hour as compared to exercise (paired t-test, P = 0.012).
- However, for older boys (n=4) the 1 hour increase in FVIII levels was similar:
  - Exercise: 2.57 fold (± 0.92)
  - DDAVP challenge: 2.42 fold (± 1.57)

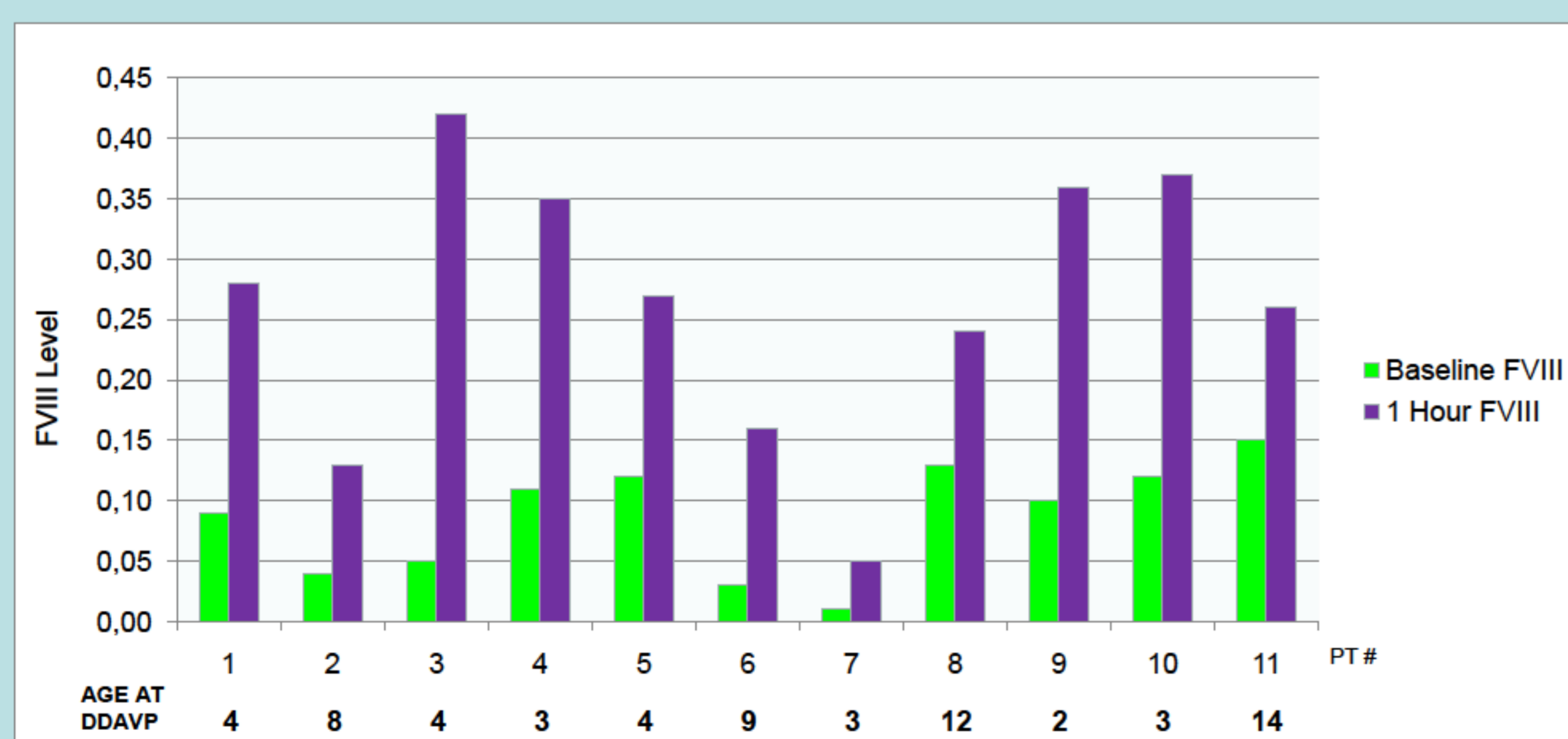
Figure 1: FVIII results from exercise study at baseline, 5 minutes and 1 hour post exercise.



FVIII levels increased by 1.97 (± 1.44) fold 5 minutes post exercise (compared to baseline) and by 1.68 (± 0.97) fold 1 hour post exercise.

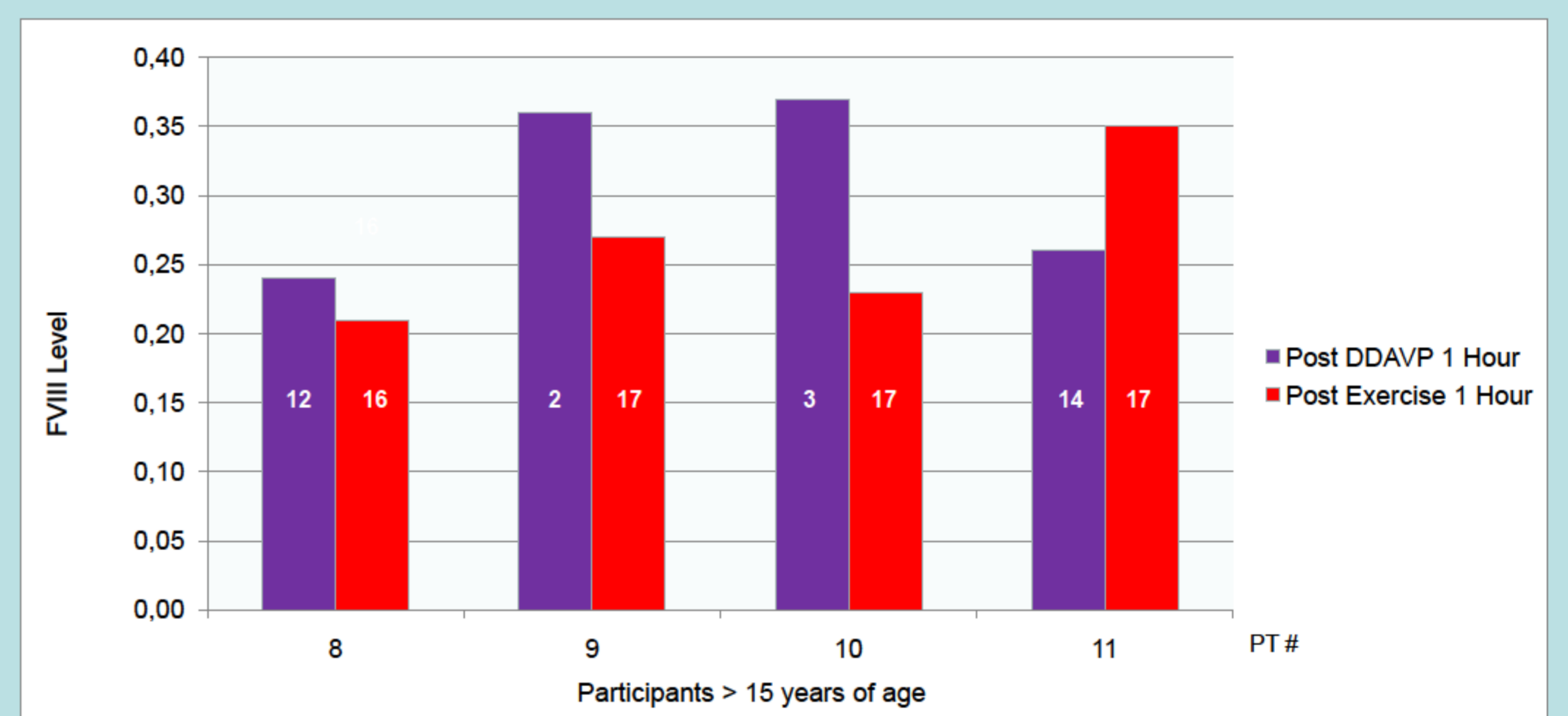
Older boys (>15 years; n=4) showed greater hemostatic improvement with exercise: the mean increase of FVIII 1 hour post exercise was 2.57 fold (± 0.92).

Figure 2: FVIII results from DDAVP challenge at baseline and 1 hour post DDAVP infusion.



FVIII levels increased by 3.7 (± 1.92) fold at 1 hour post DDAVP infusion.

Figure 3: FVIII levels at 1 hour post DDAVP and 1 hour post exercise in the age cohort of >15 years.



## SUMMARY & CONCLUSIONS

- While the FVIII level increase was more robust with DDAVP than with exercise in our entire cohort, similar responses were seen in older boys suggesting that at least for older boys exercise may produce similar hemostatic response to DDAVP.
- Whether exercise and DDAVP might have additive effects on FVIII levels needs to be tested.
- This may challenge the practice of some patients taking DDAVP pre-exercise.
- The small number of patients and large time interval between DDAVP challenge and exercise study has prompted us to confirm our findings in a larger cohort of adult patients.

## ACKNOWLEDGEMENTS

We would like to acknowledge Pfizer Canada for their support of the SickKids Exercise Study. Dr Riten Kumar is currently affiliated with Nationwide Children's Hospital, Columbus, USA.

