Aspirin resistance in a paediatric population with congenital heart diseases

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BACKGROUND

Aspirin resistance in adults has an incidence of 5% to 50% depending on the laboratory test used. Data in paediatric setting are lacking.

AIM OF THE STUDY

Our aim was to evaluate the incidence of ASA resistance in a paediatric population with congenital heart diseases.

METHODS

Included were children (6 months to 18 years old) on maintenance aspirin therapy (3-5mg/kg/die). Venous blood samples were collected 4, 5 and 6 hours after drug administration and plasma concentrations of ASA and salicylic acid were assayed by HPLC. The effect of aspirin on platelet aggregation was assessed using the ASPItest.

RESULTS

Since July 2016 20 patients were enrolled. There were 11 ASD, 5 univentricular hearts, 1 interrupted aortic arch, 1 TOF, 1 AV canal, and 1 post-actinic cardiomyopathy. The results of ASPItest are available for 17 patients. There were 2 patients (12%) with high on-treatment platelet reactivity (HPR) (cut off >39U). No clinical thrombosis occurred.

RESULTS

Demographics

Demographics	Mean	SD
Sex (M/F)	10/10	-
Age (years)	8.2	4.3
Weight (Kg)	28.1	15.7
Height (cm)	126.8	27.0
Dose (mg)	79.7	28.2
Dose/Kg (mg)	3.12	0.67

Pharmacokinetics & pharmacodynamics

		Mean	SD
Aspirin	AUC (ng/mLxh)	80	83
	Cmax (ng/mL)	53.7	55.3
	Tpeak (h)	4.80	0.77
Salicylic acid	AUC (ng/mLxh)	4,528	5,004
	Cmax (ng/mL)	3,127	3,286
	Tpeak (h)	4.35	0.74
Aspi Test	AUC (U)	24.9	11.4

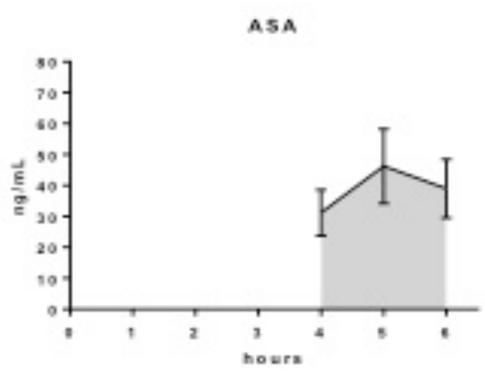


Figure 1.

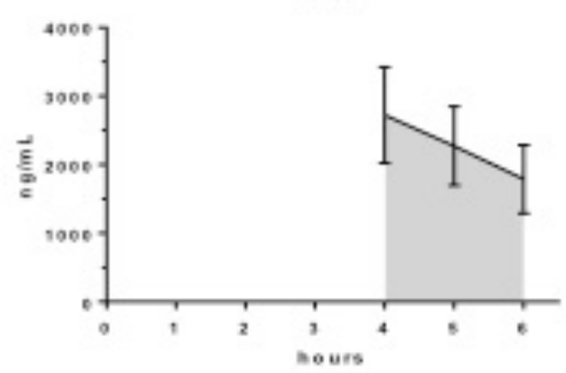
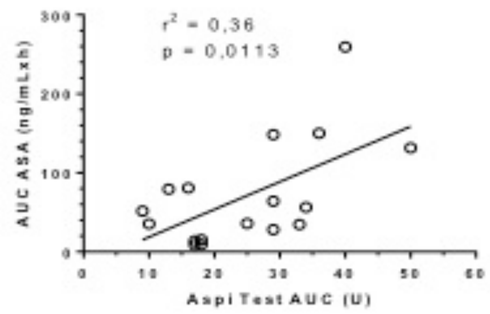
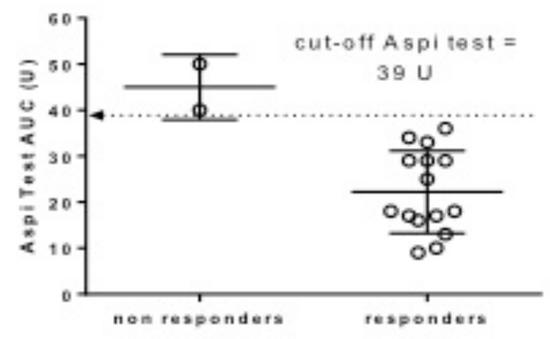


Figure 2.

The time courses of mean ASA and salicylate concentrations were similar to those outlined in adults (Figure 1 and 2).



The ASPI test values were linearly correlated with ASA concentrations (r^2 = 0,36; p = 0,0113; Figure 3).



effective COX-1 inhibition (ASPItest cut off> 30, ASA concentration cut off >100ng/mLxh, p=0,005)

CBC values, age, weight were not related to aspirin response. High blood cellularity might play a role in HPR (neutrophil count and MCV reached borderline significance, respectively p=0,062 and p=0,075). When dichotomous variables were analysed, significance was reached using a lower cut off for the ASPItest suggestive of effective COX-1 inhibition (ASPItest cut off> 30, ASA concentration cut off >100ng/mLxh, p=0,005).

CONCLUSION

Aspirin resistance had a non-trivial incidence in our small population. High plasmatic ASA concentration correlates with HPR. Limitations are a low population number and the use of only one platelet reactivity test.