VERTICAL-TRANSMISSION HIV INFECTION: RESPONSE TO VACCINES

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BACKGROUND

Vaccines are one of the most effective preventive measures worldwide. Many factors can influence individual immune response, above all the development of antibodies in reaction to vaccination. Especially, **HIV vertical transmission** determines an aberrant immune response to childhood vaccinations.

METHODS

Retrospective, observational study.

Study Population:

- 68 patients
- **HIV congenital infection**
- **vaccinated** according to the Italian National Immunisation Schedule

For each patient, we evaluated:

- **first available serology** after completing immunization schedule, at around 6 years of age (1991-2011)
- **most recent serology**, after at least ten years (2014-2016).

Multivariate logistic regression models were used to compare serologies with medical history and clinical data

	Recent data	1st visit	2nd visit	P value
M	28 (41.18%)	-	-	-
Currently on therapy	67 (98.53%)	-	-	-
AZT	46 (67.65%)	-	-	-
HAART exclusively (n=67)	11 (16.18%)	-	-	-
Years on therapy	14.70 (5.35)	-	-	-
Age	-	10.13 (5.10)*	19.60 (5.89)	>0.001
CD4+	-	833.70 (654.63)**	702.29 (323.06)	0.1211
% CD4+	-	26.10 (10.30)**	31.76 (9.72)	<0.001
HIV viral load	-	30106.07 (94659.49)**	695.94 (3409.87)	0.0222
* n=59				
** n=58				

RESULTS

Compared to the general population, the 68 patients enrolled showed an **inferior seroconversion rate**.

- Multivariate analysis showed a direct correlation between a **low CD4 level** and the presence of **HBsAg**.

McNemar test on positive serologies

	Positive serologies at 1st visit	Positive serologies at 2nd visit	Difference P value
Diphtheria	12 (21.43%) n=56	16 (23.88%) n=67	1.00
Tetanus	24 (42.11%) n=57	17 (25.37%) n=67	0.0072
Pertussis			
IgA	0 (0.00%)	-	-
IgG	13 (27.66%) n=47	-	-
Polio	45 (80.36%) n=56	-	-
HBV			
HBsAg	4 (6.90%)	4 (6.90%)	10.000
Anti-HBsAg	13 (22.41%)	11 (18.97%)	0.7266
Anti-HBcAg	6 (10.34%) n=58	5 (8.62%) n=58	0.5000
Measles			
IgM	2 (3.57%)	1 (1.59)	10.000
IgG	21 (37.5%) n=56	27 (40.55%) n=65	10.000
Mumps			
IgM	0 (0.00%)	1 (1.64%)	10.000
IgG	18 (32.14%) n=56	29 (47.54%) n=61	0.2668
Rubella			
IgM	1 (1.69%)	1 (1.69%)	10.000
IgG	30 (54.55%) n=55	36 (61.02%) n=59	0.3877
Varicella			
IgM	1 (1.72%)	0 (0.00%)	10.000
IgG	34 (58.62%) n=58	52 (86.67%) n=62	<0.001

- The development of **anti-HBsAg antibodies** was observed in young children that were **never treated** with **AZT monotherapy**. In the second serology, an adequate CD4 level appeared to be linked to a good antibody titre.

Multiple linear regression for HBsAg at 2nd serology

	OR	95% IC ²²	p value
Male	-1.53	(-4.11, 1.05)	0.244
Age (years)	-0.08	(-0.44, 0.28)	0.651
Therapy duration	0.14	(-0.19, 0.47)	0.394
CD4+	-0.01	(-0.02, 0.00)	0.038

Multiple linear regression for Anti-HBsAg antibodies at 2nd serology

	OR	95% IC	p value
Male	0.52	(-1.62, 2.67)	0.632
Age (years)	-0.27	(-0.53, -0.01)	0.041
Never on AZT monotherapy	-2.79	(-5.14, -0.44)	0.020
CD4+	0.00	(0.00, 0.01)	0.055

Positive serologies at 1st visit

	Positive serologies at 1st visit	Seroconversion in HIV-infected children on HAART ²⁹
Diphtheria	21.43%	53-100%
Tetanus	42.11%	53-100%
Pertussis	27.66%	53-100%
Polio	80.36%	97%
HBV	22.41%	46-92%
Measles	37.5%	39-82%
Mumps	32.14%	89%
Rubella	54.55%	80%
Varicella	58.62%	65%

CONCLUSIONS

As reported in literature², our HIV-infected patients developed **lower antibody titres** after vaccinations compared to the general population.

Take home messages:

- monitor closely children susceptible to vaccine-preventable diseases, identifying those who would require earlier booster doses.
- the **higher titers** reported in children that were **never** exposed to **AZT monotherapy** is an encouraging perspective for patients that were immediately treated with combined therapy.