

Changes in newborn congenital diseases and prematurity in Gaza under attacks

A summary of findings from Surgery, Maternity and Pediatric Hospitals

N. Baraquouni¹, Y. Abed², H. El Wadia³, A. Abu Hamda³, H. Madhi⁴, A. Naim⁵, El Luch⁴, S. Skaik⁶, Naser Abu Shaban⁷, Nafiz Abu Shaban⁸, S. Signorello⁹, R. Minutolo¹⁰, P. Manduca¹¹.

¹-Nasser Pediatric Hospital, Gaza, Palestine, ²-Al Quds University, Faculty of Public Health, Gaza, Palestine, ³-NICU Al Shifa Hospital, Gaza, Palestine, ⁴-Maternity Department Al Shifa Hospital, Gaza, Palestine, ⁵-Palestinian Energy Authority, Gaza, Palestine, ⁶-Medical General Directorate, Al Shifa Hospital, Gaza, Palestine, ⁷-Human Resources Directorate, Al Shifa Hospital, Gaza, Palestine, ⁸-Burn Unit Al Shifa Hospital, Gaza, Palestine, ⁹-Medicine, ¹⁰-Nephrology Department, University of Naples, Italy, ¹¹-Professor of Genetics, University of Genoa, and NWRG, Italy

Retrospective study in 5 pediatric hospitals

Comparison of prevalence in 0-2 years old children in 2006 and 2010:

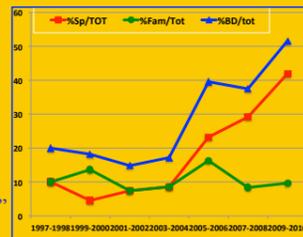
A) increase of BD, and B) specifically of Renal and NT BD, in unrelated parental couples, in Gaza and Rafha

Prevalence and Frequency of Major birth defects per 1000 admission in all hospitals in the first six months of 2006 and 2010	2006	2010	P-value
First 6 months of year	273	331	
BD patients	273	331	
Total 0-2 year old patients	6020	5254	
Frequency of BD 0-2 Y	39.5/1000	63/1000	<0.001
Total 0-12 year old patients	10130	7201	
Frequency of BD 0-12 Y	27/1000	46/1000	<0.001
Estimated Children 0-2 Y	93,760	98,664	

Congenital Defects	2006			2010			P Value
	Number	Percent	Frequency/1000	Number	Percent	Frequency/1000	
Congenital Heart Disease	207	35.5	25.9	189	37.3	23.3	0.07
Cleft palate & Cleft Lip	1	0.4	0.1	2	0.6	0.3	
Neural tube defects (NTD)	1	0.4	0.1	19	5.7	2.7	<0.001
Limbs Defect	1	0.4	0.1	7	2.1	1.0	
Skeletal Anomalies	4	1.5	0.6	1	0.3	0.1	
Cerebral Anomalies	6	2.2	0.9	2	0.6	0.3	
Chromosomal Anomalies	34	8.8	1.5	38	8.5	4.0	0.126
Renal Anomalies	6	2.2	0.9	49	14.8	7.1	<0.001
Down syndrome	9	3.3	1.3	10	3	1.4	0.404
Diagnosed Infants	1	0.4	0.1	3	0.9	0.4	
Others	8	2.9	1.2	21	6.3	3.0	

Reconstruction study from families with previous BD at Shifa maternity: increase in BD (1997-2010) starts in 2005 and continues to 2011

% of malformations (BD) on the total number of births in families with a normal newborn baby born in 2011 and with a previous child with birth defect. Significant trend of increase of "sporadic" BD (Sp, p < 0.001), but not of "familial" (Fam, p = 0.59) ones, suggests induction of their occurrence by the environment.



Conclusions 1

Increase in BD in time since 2005, with additional increase after Cast lead, continuing till 2013 and in temporal association with war events and with weapon exposure of population.

NEEDS

Post war assessment of damages
Analysis in time of affected children and their mothers
Development of diagnostic tools, and skills, pre- and post- natal
Support in personnel and funds to grant the needed continuity in work

Registration of cases in Neonatal Intensive case Unit, Shifa, from 2006 to 2013: significant increase in BD in time- from 10.7% in 2006 to 12.3% in 2012 among the admissions in al Shifa hospital NICU.

Registration of births in Al Shifa, 2011 and relationship with exposures to Cast Lead: significant positive association with mother's exposures to White Phosphorus

exposure	exposure to WP and bombing			
	responding	no exposure	only WP	only Bombs
total normal babies	2933	2884 (98,3%)	49 (1,7%)	not available
total birth defect babies	44	19 (43,2%)	12 (27,2%)	9 (20%)
grand total	2977	2903 (97,5%)	51 (2%)	

total exposed to weapons for Birth defect children is 66%

Specific and different contamination with metals teratogens or toxicants from in utero exposure of BD or preterm babies born in 2011 and conceived two years after Cast lead by war exposed mothers:

TABLE I Comparison of newborns with or without BD				Comparison of normal gestation age and premature newborns			
Metal	Newborns with BD Gaza 2011 (48)	Normal newborns Gaza 2011 (12)	p-value*	Metal	Prematurely born Gaza 2011 (9)	Normal Newborns Gaza 2011 (12)	p-value*
Sn	0.23 (0.08-0.54)	0.04 (0.02-0.09)	0.002	Sn	0.25 (0.02-0.89)	0.04 (0.02-0.09)	0.002
Ba	0.74 (0.51-1.27)	0.60 (0.37-0.79)	0.154	Ba	1.07 (0.62-1.58)	0.60 (0.37-0.73)	0.030
W	0.03 (0.02-0.07)	0.02 (0.01-0.04)	0.365	W	0.03 (0.02-0.03)	0.02 (0.01-0.03)	0.190
Hg	0.93 (0.02-0.25)	0.00 (0.00-0.02)	0.003	Hg	0.00 (0.00-0.05)	0.00 (0.00-0.02)	0.470
Pb	0.81 (0.49-1.16)	0.60 (0.52-1.21)	0.820	Pb	1.06 (0.73-2.10)	0.60 (0.52-1.21)	0.190
U	0.00 (0.00-0.00)	0.00 (0.00-0.00)	0.164	U	0.38 (0.22-0.47)	0.13 (0.05-0.24)	0.004
Se	0.03 (0.02-0.06)	0.05 (0.04-0.11)	0.160	Se	0.05 (0.00-0.17)	0.13 (0.09-0.24)	0.160
Sb	0.03 (0.02-0.06)	0.05 (0.03-0.09)	0.143	Sb	0.06 (0.02-0.17)	0.05 (0.04-0.11)	0.550
Cd	0.41 (0.29-0.59)	0.78 (0.38-1.17)	0.053	Cd	0.08 (0.06-0.09)	0.05 (0.03-0.09)	0.280
Cr				Cr	0.75 (0.46-0.78)	0.78 (0.38-1.17)	0.810

Data are: median values for ppm and interquartile range (IGR)
*(Wilcoxon-Mann-Whitney)

Conclusions 2

Correlation between individual exposure, objectively proved, and BD child. Effect detected 2y after exposure to attacks in mothers of BD children exposed to Cast lead. Specific association of BD or premature babies with contamination by teratogens or toxicants.

AVAILABLE CAPABILITIES

Good will and planning capabilities of local professionals
Personnel skills present, and in further training available in Gaza
Collaborations with professionals abroad

MILITARY OPERATIONS TIMING, SUMMARY

2004
May- IDF launched a series of armored raids M-113 APCs
May 18- the IDF launched Operation Rainbow
September 29-October 19, Operation Days of Penitence...Thanks, ground troops and Israeli rocket Israeli unmanned drone aircraft fired a missile
Israeli tank fired artillery at homes
September-october tank fired artillery at homes
missile fired from a helicopter
Israeli tanks fired shell.
helicopter gunship fired
2005
June 28- November 26 Operation Summer Rains tanks, APCs and troops
air force had taken out two main bridges and the only powerstation in the heavily armored equipment as the Merkava heavy tank and armored personnel carriers, and carried out airstrikes with various military aircraft including F-16s, drone aircraft and helicopter gunships
2006-June 9-29
December 2008-January 2009 -Operation Cast lead
14-21 November 2012-Operation Pillar of cender
July7- August 26 2014 -Operation Protective edge

Metal contaminants from weapons were detected in In wounds of victims

	Al	Hg	W	Mo	Cd	Co	U	V	Sr	Ba	Sn	Pb	Ni	B
ters 06-09	yes	yes	yes	yes	yes	yes	no	no	no	no	yes	no	no	no
r fall09	yes	no	yes	yes	yes	yes	yes	yes	no	no	no	no	no	no
shell 09	yes	yes	yes	yes	no									
wound 09	yes	yes	no	yes	no	no	yes							
putation 09	yes	yes	no	yes	no	yes	no	yes						
bonized 09	yes	yes	no	no	no	no	no	yes						
face burn 09	no	yes	no											

Legend:
= high above control
= similar to control
= little above control
= toxic
= teratogen
= carcinog.

Conclusion 3

Teratogens are delivered by not fragmentaion weaponry in wounds of victims, are components of WP ammunitions and bombs. These teratogens are resilient in environment and still found in bodies at distance of 1 year from attacks. They are found in babies contaminated in utero and conceived two years later than cast lead, either because of accumulation in mother's bodies or because they persist in the environment, and associate specifically with BD, or premature phenotypes.

HEALTH GOALS

Register of births: ongoing
Remediation: research ongoing
Prevention of damages: only cessation of war