

War Stories of Male Infertility in Lebanon



Marcia C. Inhorn, PhD, MPH
William K. Lanman Jr. Professor
Department of Anthropology
Chair, Council on Middle East Studies
MacMillan Center for
International & Area Studies
Yale University

Background



- Council on Middle East Studies
- 2008-9 Theme Year: “Health and Conflict in the Middle East”
- March 2009 Yale-AUB Conference
- Special issue of *Global Public Health*
- *Reconceiving Middle Eastern Manhood: Islam, Assisted Reproduction, and Emergent Masculinities*

Why This Project?



- Female infertility research in the Middle East (1988-present)
- Research in IVF clinics involved men
- Male infertility rates overwhelming

Why Study Male Infertility in the Middle East?

- High rates of male infertility in the Middle East (70-30 vs 50-50 ratios)
- Potentially one of the most stigmatizing, emasculating, hidden male health conditions
- Men in high-fertility societies expected to have children, especially sons, for family continuity

Why Study Male Infertility in the Middle East? (cont.)

- Middle Eastern men may compete over virility and fertility as essence of manhood
- Men in the Middle East may be at increased risk of male infertility (genetic, lifestyle, and environmental factors)
- Emergence of ICSI to overcome male infertility
- “Missing men” in reproductive health

What Is Male Infertility?



- Oligospermia (low count)
- Asthenospermia (poor motility)
- Teratozoospermia (poor morphology)
- Azoospermia (lack of sperm in the ejaculate; either obstructive or non-obstructive)

Possible Risk Factors for Male Infertility

- Genetic (consanguinity and Y-deletions)
- Untreated childhood illness (undescended testicles, mumps orchitis)
- Untreated infections (TB, STDs)
- Smoking (cigarettes, waterpipes)
- Caffeine consumption
- Nutritional deficiencies (zinc, selenium)

Possible Risk Factors for Male Infertility (cont.)



- Occupational exposures (lead and other metals, chemicals, pesticides, heat, radiation)
- Environmental exposures (ambient lead, other toxins)
- *Stress,* including war stress

Research Questions



- Is there a relationship between war and male infertility?
- If so, what causal mechanisms underlie men's increased risk (e.g., stress, toxins)?
- Have wars in the Middle East led to male infertility outcomes?
- Does Lebanon provide such a case study?

Civil War in Lebanon (1975-90): Important Actors



- Lebanese Army
- Lebanese Militias (Religiously Based)
- PLO
- Syria
- Israel
- Iran (Hizbullah)
- The “West”: United States, France, Italy
- Russia

Outcomes of War in Lebanon

- Death of 7% of population
- Serious injuries of 10% of population
- Displacement of 25% of population
- Emigration of 30% of population
- War orphaning, esp. in Shia communities
- Demographic imbalances (1:7 male:female)

Outcomes of War in Lebanon

- Destruction of physical infrastructure (buildings, roads, power, phones)
- Environmental deterioration (sanitation, pollution, deforestation, toxic waste dumping)
- Degradation of social services
- Devaluation of currency and post-war economic crisis

Outcomes of War in Lebanon (cont.)

- Post-war mental health crisis
- Breakdown of social trust between sects
- Scapegoating of Palestinians in refugee camps in Lebanon
- Ongoing Syrian military presence
- Strengthening of Hizbullah
- Israeli occupation (1982-2000) and “summer war” (2006)

Research Project


- Fulbright and NSF-funded project: “Middle Eastern Masculinities in the Age of New Reproductive Technologies”
- Project on male infertility, masculinity, & ARTs (i.e., ICSI, a new variant of IVF)
- Book project—*Reconceiving Middle Eastern Manhood: Islam, Assisted Reproduction, and Modern Masculinities*

Research Sites



- Beirut, Lebanon: 2003
- 8 months of anthropological-epidemiological research, January-August
- Two IVF clinics (private university hospital and private clinic)

Research Subjects



- 220 men (120 infertile cases, 100 fertile controls)
- Mostly Lebanese; also Syrian, Palestinian
- All religious sects (Christian, Muslim, Druze)

Research Methods



- 220 semi-structured reproductive history and epidemiologic interviews
- 220 open-ended ethnographic interviews
- Fieldnotes on participant observation in IVF clinics and informal conversations
- > 200 blood samples for toxic metal analysis (by Co-PI Jerome Nriagu)

Men's Own Etiological Assessments of Male Infertility

- Stress (multiple causes of *dagat*)
- Heredity
- Toxins (in food, air)
- Occupational risk factors (chemicals, heat)
- Sexual guilt and self-blame (masturbation, promiscuity, use of prostitutes)
- War (*il harb*)* ** *

War and Male Infertility: Possible Relationships

- Stress and fear (eg, kidnapping, deaths of family members)
- Injuries as combatants and civilians
- Residential exposure to bombing
- Imprisonment and genital torture
- Use of medicines (to decrease libido and anxiety)
- Use of depleted uranium (DU)

War and Male Infertility: Possible Relationships(cont.)

- Forced relocation and male outmigration, leading to:
 - Premarital sex with multiple partners
 - STDs
 - Delayed marriage and childbearing
 - Decreased fertility and sexual problems

War Stories of Male Infertility



- Hassan: The Army Commando
- Johnny: The Militia Man
- Hussein: The Tortured Prisoner
- Abbas: The Bombing Escapee
- Ali: The African Exile

Verifying Men's Stories: Epidemiological Evidence

- Abu-Musa et al., “Effect of the Lebanese Civil War on Sperm Parameters” (*Fertility & Sterility* 2007;88:1579-82)—Findings:
 - a) semen samples compared, during war (1985-1989) vs post-war (1991-1995),
 - b) sperm count significantly lower during war (% <20 million, $p < .001$),
 - c) increased stress during war time

Verifying Men's Stories: Epidemiological Evidence

- Kobeissi et al., “Civil War and Male Infertility in Lebanon” (*Fertility & Sterility* 2008;90:340-45) –Findings:
 - a) case-control study (infertile v fertile men)
 - b) cases had 57% increase in odds of war exposures (combat, injury, kidnapping, bombing, displacement),
 - c) causal factors: toxins or stress

Toxins?



- Inhorn et al., “Occupational and Environmental Exposures to Heavy Metals: Risk Factors for Male Infertility in Lebanon?” (*Reprod. Toxicol.* 2008;25:203-212)—Findings:
 - a) case-control study (infertile v fertile men)
 - b) blood concentrations of heavy metals
 - c) normal ranges for both cases & controls

Stress



- Basic mechanism behind stress-induced testosterone suppression:
- Luteinizing hormone (LH) is primary hormone (gonadotropin) secreted by pituitary
- LH (gonadotropin) stimulates Leydig cells in testes to produce testosterone

Stress (cont.)



- During periods of acute or chronic stress, adrenal glands secrete glucocorticoids, primarily cortisol
- Cortisol blocks LH receptors in Leydig cells
- Result is suppression of testosterone production

Conclusions



- War is bad for human health
- War is bad for male reproductive health
- War is related to male infertility outcomes in Lebanon
- War stress may be a causal factor

Future Studies



- Reproductive ecology studies of men during and after wartime
- Evidence-based biological assay studies of physiological stress
- Collection of both salivary and semen samples in men for correlation studies
- More studies of male infertility
- More studies of male reproductive health