Interpersonal trauma as a marker of risk for urinary tract dysfunction in women

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Individual trauma results from an event, series of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or life threatening and that has lasting effects on the individual’s functioning and mental, physical, social, emotional, or spiritual well-being.

- Substance Abuse and Mental Health Services Administration (SAMHSA)
Psychological sequelae of trauma

- Traumatic experiences invoke sympathetic *flight, fight, or freeze* responses
- Responses become counterproductive when activated for too long (constant flood of adrenaline and cortisol)
- Traumatic experiences can cause people to react to normal stimuli with excess fear or anxiety
- Victims of trauma may cope by turning to alcohol, other drugs, or high-risk behaviors
- Extreme manifestation: post-traumatic stress disorder (PTSD)

*Source*: Centers for Disease Control and Prevention
Interpersonal violence and PTSD are common in women

Breiding, MMWR 2014
Early epidemiologic studies of abuse and genitourinary dysfunction in girls or young women

- Adverse childhood experiences (ACEs) are associated with increased risk of sexually transmitted infections in adulthood
  - VJ Felitti et al, American Journal of Preventive Medicine, 1998

- Childhood and adolescent abuse are associated with increased urinary frequency, urgency, and nocturia in adulthood
  - C. Link et al, European Urology, 2007

- Up to 12 years after sexual abuse, girls have more diagnoses for urinary and genital problems
  - P Vezina-Gagnon et al, Journal of Pediatrics 2018
Reproductive Risks of Incontinence Study at Kaiser (RRISK)

• Observational cohort of ~2,000 women over 40 years of age enrolled in Kaiser Permanente Northern California (KPNC)

• Long-term female enrollees sampled by age and race/ethnicity (~40% non-Latina White, ~20% Latina White, ~20% Black, ~20% Asian)

• Wave 3 involving assessment of exposure to interpersonal violence during home-based study visits from 2008-2012

• Mean age 61 years, 14% born outside the U.S., 19% with no college education, 69% with a spouse or partner, 4% with a history of same sex relationships, 69% multiparous, mean body mass index ~30 kg/m²
Assessment of interpersonal violence exposures in RRISK3

Self-administered questionnaires assessed lifetime exposure to:

- **Physical intimate partner violence (Physical IPV)** (being pushed, shoved, punched, or threatened with a weapon)

- **Emotional/verbal intimate partner violence (Emotional IPV)** (being severely criticized, called worthless, threatened with harm)

- **Sexual assault** (being touched in sexual parts of body without consent, including being fondled, groped, or raped)

Mouton et al., Annals of Family Medicine, 2010
Assessment of common urinary tract symptoms and infections in RRISK3

Structured items focusing on most common symptoms in women:

• **Stress-type UI** – leakage “with an activity like coughing, sneezing, or exercise” in the past month (with further differentiation of frequency)

• **Urgency-type UI** – leakage “with an overwhelming urge to urinate or difficulty holding urine” in the past month (differentiation of frequency)

• **Nocturia** – frequency of needing to urinate “from the time you go to bed at night until the time you get up in the morning”

• **Bladder pain** – “pain or discomfort in your bladder” in the past 3 months rated on a 10-point Likert scale

• **Clinician-diagnosed UTIs** – history of clinician-prescribed antibiotic treatment for UTIs
# Lifetime exposure to interpersonal violence in RRISK3, by race/ethnicity

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>White</th>
<th>Latina</th>
<th>Black</th>
<th>Asian</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical IPV</td>
<td>16%</td>
<td>17%</td>
<td>17%</td>
<td>23%</td>
<td>6%</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Emotional IPV</td>
<td>21%</td>
<td>27%</td>
<td>21%</td>
<td>24%</td>
<td>8%</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Sexual assault</td>
<td>19%</td>
<td>25%</td>
<td>17%</td>
<td>22%</td>
<td>8%</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

All reported percentages are column percentages

*P-value for heterogeneity by race/ethnicity

From C. Gibson et al, JAMA Internal Medicine, 2019 (PMID: 30453319)
Past year versus lifetime interpersonal violence exposures in RRISK3

<table>
<thead>
<tr>
<th></th>
<th>Past year</th>
<th>Ever</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical IPV</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Emotional IPV</td>
<td>14</td>
<td>21</td>
</tr>
<tr>
<td>Sexual Assault</td>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>
Current incontinence and nocturia symptoms in RRISK3, by race/ethnicity

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Total</th>
<th>White</th>
<th>Latina</th>
<th>Black</th>
<th>Asian</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress-type UI (≥weekly)</td>
<td>23%</td>
<td>29%</td>
<td>28%</td>
<td>14%</td>
<td>13%</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Urgency-type UI (≥weekly)</td>
<td>23%</td>
<td>26%</td>
<td>24%</td>
<td>26%</td>
<td>15%</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Nocturia (≥2 times/night)</td>
<td>35%</td>
<td>34%</td>
<td>44%</td>
<td>26%</td>
<td>28%</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

All reported percentages are column percentages
*P-value for heterogeneity by race/ethnicity

Adjusted odds of incontinence and nocturia with exposure to intimate partner violence and sexual assault

Physical IPV
- Stress-type UI
- Urgency-type UI
- Nocturia

Emotional IPV
- Stress-type UI
- Urgency-type UI
- Nocturia

Sexual assault
- Stress-type UI
- Urgency-type UI
- Nocturia

*Adjusted for age, race/ethnicity, education, pelvic surgery, parity, menopause, body mass index, medications

Significant after further adjustment for depression
Other evidence of unique and potent effects of emotional abuse on health

- Childhood and adult emotional abuse (not physical abuse) associated with sexual dysfunction in the Boston Area Community Health survey

- Physical and emotional abuse with similarly adverse and broad psychiatric consequences in low-income children

- Past-year emotional abuse associated with a >70% increased odds of urinary incontinence and urinary problems among older women in the National Social Life Health and Aging Project
### Self-reported bladder pain and urinary tract infections in RRISK3, by race/ethnicity

All reported percentages are column percentages

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>White</th>
<th>Latina</th>
<th>Black</th>
<th>Asian</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bladder pain</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any pain</td>
<td>22%</td>
<td>23%</td>
<td>22%</td>
<td>20%</td>
<td>23%</td>
<td>.79</td>
</tr>
<tr>
<td>Moderate-severe</td>
<td>15%</td>
<td>14%</td>
<td>17%</td>
<td>13%</td>
<td>16%</td>
<td>.65</td>
</tr>
<tr>
<td><strong>Clinician-treated UTI</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any lifetime</td>
<td>60%</td>
<td>65%</td>
<td>60%</td>
<td>59%</td>
<td>51%</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Past 12 months</td>
<td>13%</td>
<td>16%</td>
<td>15%</td>
<td>10%</td>
<td>11%</td>
<td>.06</td>
</tr>
</tbody>
</table>

*P-value for heterogeneity by race/ethnicity

Previously presented by E. Raphael, pending UCSF UroEpi K12 scholar
Adjusted odds of bladder pain and urinary tract infections with exposure to interpersonal violence

**Bladder pain (current)**
- Physical IPV
- Emotional IPV
- Sexual assault

**Clinician-treated UTIs (lifetime)**
- Physical IPV
- Emotional IPV
- Sexual assault

*Significant after further adjustment for depression*

*Adjusted for age, race/ethnicity, education, pelvic surgery, parity, sexual activity, menopause, body mass index, diabetes*
Assessment of post-traumatic stress disorder (PTSD) in RRISK3

Self-administered PTSD Checklist-Civilian Version questionnaire:

- Based on DSM-IV criteria for PTSD and validated against gold-standard structured interview
- Past month re-experiencing, avoidance, hypervigilance, and mood symptoms related to past stressful experiences
- Threshold for clinically significant PTSD symptoms: score ≥ 30 in primary care populations

Walker et al., Gen Hosp Psychiatry, 2002
Over a third of women in each interpersonal violence exposure group report PTSD symptoms.
Adjusted odds of incontinence, nocturia, bladder pain, and UTIs associated with PTSD symptoms

*Adjusted for age, race/ethnicity, education, pelvic surgery, parity, body mass index, menopause, medications
Limitations and caveats

• Limited information about duration or severity of traumatic exposures

• Urinary symptoms and infections assessed by questionnaire, without further clinical or laboratory evaluation

• Cross-sectional study limiting ability to draw conclusions about causality
Primary findings

• Interpersonal abuse may be an under-recognized marker of risk for urinary tract dysfunction in midlife and older women

• Physical abuse may be a less potent marker of risk than emotional abuse or sexual assault for some common urinary symptoms

• PTSD, as opposed to just exposure to violence or abuse, is most strongly associated with symptomatic urinary tract dysfunction

• Relationships between traumatic exposures or PTSD and urinary outcomes are not solely explained by depression
Trauma-informed care

1. Realizes the widespread impact of trauma and understands potential paths for recovery

2. Recognizes the signs and symptoms of trauma in clients, families, staff, and others involved with the system

3. Responds by fully integrating knowledge about trauma into policies, procedures, and practices

4. Seeks to actively resist re-traumatization

Substance Abuse and Mental Health Services Administration (SAMHSA)
Future research directions

- Prospective evaluation of temporal associations and dose relationships between trauma exposures and urinary outcomes
- Clinical evaluation of therapies directed at ameliorating trauma to assess effects on urinary outcomes
- Mechanistic research to identify pathways linking trauma, psychological stress, and urinary tract dysfunction
- Evaluation of relationships between trauma and urinary tract dysfunction in men
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