RESEARCH LETTER

Treatment Compliance Among Asymptomatic Adolescents With Sexually Transmitted Infections

Patients seen in adult and urban pediatric emergency departments have high rates of sexually transmitted infections (STIs).1–3 Treatment of adolescent patients testing positive for an STI once discharged from the pediatric emergency department is a concern, particularly among those who are asymptomatic and may not understand the importance of treatment. Studies have shown that health care professionals are able to contact patients with their test results; however, it is unclear in the literature whether asymptomatic adolescent Chlamydia trachomatis (CT)–positive patients obtain their prescriptions from pharmacies or Neisseria gonorrhoea (GC)–positive patients return for oral and intramuscular treatment.4,5 The objective of this study was to evaluate treatment compliance among asymptomatic adolescents with positive STI results.

Methods | This study is part of a larger cross-sectional GC/CT screening study conducted over 10 months in which we enrolled a convenience sample of adolescent males and females, 14 to 21 years of age, who presented to the pediatric emergency department of our children's hospital with a non–STI-related chief concern. This study was reviewed and approved by the Cincinnati Children's Hospital Medical Center Institutional Review Board with a waiver of parental consent. Each patient was approached in a private room and informed that the study was about a confidential adolescent topic. Patients were asked to provide a confidential telephone number. If none existed, they were informed that a home telephone number would be used to contact them in the event of a positive test result. Urine samples were collected and sent to the Ohio Department of Health for GC/CT testing using BD ProbeTec GC/CT Q2 Amplified DNA Assays (BD Diagnostic Systems).

Patients with positive results were contacted in addition to calling in a prescription to a pharmacy of their choice. The pharmacy was contacted approximately 1 week later to document whether the patient obtained the prescription.6 Patients who obtained their prescription were assumed to be treated. Patients positive for GC were informed that they needed to return for oral and intramuscular treatment. The electronic medical record was used to confirm treatment among participants who returned to our institution. All participants were counseled regarding partner notification and instructed to abstain from sexual activity for 1 week after treatment and until all partners were tested and treated.

Results | Of the 1054 patients approached, 403 provided urine samples, and of which 40 (10%) were positive for an STI. Of these, we successfully contacted 38 (95%) by telephone and 29 (73%) were confirmed to have received treatment (see Table for treatment details).

Discussion | To our knowledge, this is the first study to assess whether pediatric emergency department asymptomatic STI-positive adolescents follow up to receive treatment after notification of their results. While we were only able to confirm 73% of the adolescents were treated, only 2 participants were unable to be contacted regarding their test results; thus, potentially a large majority were treated overall. We assumed that patients who filled prescriptions took the medication. This is not proof of treatment but a more practical approach than directly observed treatment. We also acknowledge that there is potential for self-selection bias; patients who agreed to participate in the study may have been more motivated to seek treatment if positive.

Screening adolescents and treating infections in the absence of symptoms may play an important role in preventing long-term sequelae and community spread of STIs. Confirming that asymptomatic STI-positive patients do receive appropriate treatment is a vital component of any screening initiative regardless of the site. Future interventions should focus on establishing structured follow-up for STI-positive patients, including locations for them to receive treatment, as well as assistance in notifying, testing, and treating their sexual partners.

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Author Contributions: Dr Schneider had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: All authors.

Table. Treatment of 40 Sexually Transmitted Infection–Positive Patients

<table>
<thead>
<tr>
<th></th>
<th>CT Only (n = 30)</th>
<th>GC Only/GC+CT (n = 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment*</td>
<td>22</td>
<td>7</td>
</tr>
<tr>
<td>Treatment unknown</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Unable to contact</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Abbreviations: CT, Chlamydia trachomatis; GC, Neisseria gonorrhoea.
* Treatment confirmed by obtaining a prescription or treatment at our institution.
** Eighteen filled their prescription, 3 returned to our institution for treatment, and 1 was treated by a campus physician prior to receiving results.
† Five did not obtain their prescription at 1 week after the pediatric emergency department visit, and 1 refused treatment and planned to seek retesting.

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Figure. Interrelations Between Oxidative Stress and Methylation Processes

1. Correct recycling of homocysteine allows generation of cysteine and methionine, which allow correct processes of methylation through the formation of S-adenosyl methionine (SAM) (1bis). 2. Correct generation of cysteine allows the synthesis of hypotaurine and glutathione, 2 potent inhibitors of reactive oxygen species (ROS). Hypotaurine is the most important anti-ROS naturally present in vivo in the natural environment of the preimplantation embryo. 3. Generation of ROS induces DNA Fragmentation. Advanced age decreases the ability to control ROS-linked decays. 4. High levels of homocysteine perturb DNA methylation processes in sperm, oocytes, and embryos. 5. DNA methylation defects, whether or not linked to imprinting, may result in negative transgenerational health problems. Unrepaired 8-oxoG (oxidized form of guanine) leads to aberrant methylation at CpG sites, which impairs transcription and may affect telomere length (TTAGGG repeats). 6. Plastic derived endocrine disruptors (bisphenol A [BPA], di-[2-ethylhexyl]phthalate [DEHP], and dibutyl phthalate [DBP]) have a negative effect on all of the steps in the pathway.

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**Link Between Increased Prevalence of Autism Spectrum Disorder Syndromes and Oxidative Stress, DNA Methylation, and Imprinting: The Impact of the Environment**

Autism is a complex neurodevelopment disorder, with a male to female prevalence of 4.3:1. The number of children diagnosed with autism or related disorders has increased at an alarming rate: the Centers for Disease Control and Prevention estimates that 1 in 68 children in the United States (or 14.7 per 1000 eight-year-olds) was identified with autism spectrum disorder during 2014. The figure reaches 1 in 45 children in the state of Alabama, and this represents an estimated 30% increase over previous estimates reported in 2012. The prevalence of these disorders has more than doubled since 2000. Here we discuss the biochemical link between the process of DNA methylation in gametes and autism.