Sex/Gender Differences in Pain and Pain Perception

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ARE THERE SEX/GENDER DIFFERENCES IN PAIN?


Consensus report

Studying sex and gender differences in pain and analgesia: A consensus report

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This conclusion is due in part to findings such as: When studying pain in humans experimentally, the balance tips towards more pain for females. (i.e., lower thresholds, less tolerance)

THE DIFFERENCES CAN CHANGE
- stimulus type
- pain scale used
- testing paradigm/end point
- bodily location
- time/rhythms
- age; reproductive status
- health status
- many social, cultural factors
- other: blood pressure; food intake; odors; etc...
“Is there enough evidence to warrant sex specific pain interventions? The evidence does not appear strong enough to warrant sex-specific pain interventions in most [all] situations. ..... findings are mixed...”

THE INDIVIDUAL IS PRIME!!
Should we give up?

Let’s consider two sex differences in pain that most of us agree are, in fact, generally true.
#1. Epidemiology: more painful conditions have a higher female prevalence than have a higher male prevalence.

<table>
<thead>
<tr>
<th>Head and Neck</th>
<th>Limbs</th>
<th>Head and Neck</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache (general/specific)</td>
<td>Carpal tunnel syndrome</td>
<td>Headache (specific)</td>
</tr>
<tr>
<td>• cephalgia (specific)</td>
<td></td>
<td>• cluster headache</td>
</tr>
<tr>
<td>• chronic tension headache</td>
<td></td>
<td>• migraine without aura</td>
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<tr>
<td>• migraine with aura</td>
<td></td>
<td>• post traumatic</td>
</tr>
<tr>
<td>• post dural puncture headache</td>
<td></td>
<td>• post traumatic</td>
</tr>
<tr>
<td>Atypical odontalgia</td>
<td>Raynaud’s disease</td>
<td>Brachial plexus neuropathy</td>
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<tr>
<td>Carotidynia</td>
<td>Reflex sympathetic dystrophy</td>
<td>Dactylitis</td>
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<tr>
<td>Chronic paroxysmal hemicrania</td>
<td>Scleroderma</td>
<td>Hemophilic arthropathy</td>
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<tr>
<td>Occipital neuralgia</td>
<td></td>
<td>Intermittent claudication</td>
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<tr>
<td>Odontalgia (without pathology)</td>
<td>Gallbladder disease</td>
<td>Meralgia paresthetica</td>
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<tr>
<td>Temporal arteritis</td>
<td>Interstitial cystitis (PBS)</td>
<td>Thromboangiitis obliteratorans</td>
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<tr>
<td>Temporomandibular disorder</td>
<td></td>
<td>Internal Organs</td>
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<tr>
<td>Trigeminal neuralgia</td>
<td>Ulcerative colitis</td>
<td>Cholecystectomy</td>
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<td></td>
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<td>Peritonitis</td>
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<td></td>
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<td>Acute intermittent porphyria</td>
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<td>Fibromyalgia syndrome</td>
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<td>Multiple sclerosis</td>
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<tr>
<td></td>
<td></td>
<td>Post cholecystectomy</td>
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<tr>
<td></td>
<td></td>
<td>Rheumatoid arthritis</td>
</tr>
</tbody>
</table>

**OPPORTUNITY:** If you are a woman, you are much more likely to have a painful chronic condition than if you are a man. We acknowledge this situation, but very little has been done to understand the bases for it.

OPPORTUNITY:

If you are a woman, you are much more likely to be using more therapies than a man would to alleviate your pain.

Yet, very little attention has been paid to how this usage difference affects the efficacy and side effects of various treatments.

ADAPTED FROM: Berkley KJ. On the dorsal columns: translating basic research hypotheses to the clinic. Pain 1997;70:103-
CHANGING SUBJECTS:
One strong conclusion from the consensus concerned the “translation-hindering” effects of “disconnects” between specialties and between basic and clinical researchers.

LESSONS FROM TWO EXAMPLES...

#1: DNIC: descending noxious inhibitory controls

Originally studied in rats, and seemingly complex, the authors showed how it could explain “counter irritation.”
DNIC: SEX DIFFERENCES?

1. Not studied in animals (!)

2. In humans, it appears that there are no sex differences (multiple reports).

3. BUT...
SOME LESSONS FROM DNIC

1. Good things happen when clinicians and researchers who work with humans listen to each other.
2. For basic researchers? Simplifying is okay.
3. For clinicians? Complicated animal models can bring us principles; e.g., “inhibition”
4. For both groups? New directions can emerge; e.g., “What’s so important about the ovulatory phase?”
#2: Jeff (and Lori’s) story

Jeff, 52, a proudly athletic man, runs a busy carpenter’s business. Here, he is up on wobbly new framing for an addition to my house. Shortly after this picture was taken, Jeff came home from the gym one Saturday noon, and told his wife, Lori, that he was tired, slightly nauseated, and his jaw had suddenly started to hurt. As he went to rest, she went to the internet, and saw that, although Jeff’s symptoms were more common in women, they could be those of a heart attack in men too. So, she got him up, and drove him to the nearby fire station, which she knew acted as first responders; Jeff and Lori were there in minutes, certainly faster than 911. Jeff was, in fact, in the midst of an MI, and the next day received two stents. Within 10 days, he was back at work, and within a month, back completely, symptomless.

Since then, in a discussion with Jeff and the construction foreman, Mike, and one of the carpenters, Jarrod, Jeff told me that, “I never would have looked up my symptoms online. Lori saved my life.” When I asked the three of them what they thought about what their wives might do with similar symptoms, Mike, piped up with a story about the wife of a friend of his who ignored symptoms like that (because they were so minor and common), and only when she collapsed did she get help. Jarrod added that just last week, his grandmother ignored suddenly-appearing pain between her shoulder blades for several days, and that when she finally took herself into the doctor, she too needed bypass surgery.
SOME LESSONS FROM JEFF AND LORI’S STORY

1. Knowledge of statistical sex differences is already beginning to save lives and improve the health of both females and males.

2. Dissemination of knowledge is key.

3. We need a better understanding of the interplay between social roles and health.

4. We shouldn’t be too discouraged by the complexity of the issues we face.

5. Seemingly “small” increments in knowledge can have big impacts.
THE INDIVIDUAL IS PRIME!!

Sex/gender differences matter!!
Thank you!