The Devil in the Garlic: Sulfate, Toxins, and the Low Sulfur Diet

A case of adaptation gone too far, and an exploration of therapeutic strategies

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Scope of the Sulfate Demand

- Average adult female has ~2.5g of iron in body*
  - Male has 2.5-3.5g**
- Average adult has 140g sulfur
  - Sulfur is ~0.3% of adult body mass***

* Iron regulates mRNA translation initiation through RNA iron responsive element (IRE)
Job Description

- Heparan sulfate glycosaminoglycans
- Heparan sulfate proteoglycans
- Liver sulfation
- Inflammatory response
- Blood pressure regulation
- Beta-cell protection*
- Glucose utilization
- Mucin production
A lesser known and gigantically important role:

- Sulfate supplies much of the negative charge for formation of structured water in the body
- Loss of water structure leads to profound cellular and systemic consequences

“Sulfate’s Critical Role for Maintaining Exclusion Zone Water: Dietary Factors Leading to Deficiencies” 10.14294/WATER.2019.5
What If The Supply Runs Low?
Why Would Supply Run Low?
Last things first: Why

- Genetics (polymorphisms in CBS, CTH/CSE, PAPSS1, TXNRD2, SUOX, and surely many others)
- Dietary (lack of enzyme cofactors such as molybdenum, magnesium, glutathione, vitamin B12, vitamin B6, and many others)
- **Toxicant** (glyphosate, heavy metals, organophosphates, organochlorides, and many others)
Cationic lipid nanoparticles (CLNs): the new toxicant on the block

- CLNs initiate inflammatory cascades*
- They are drawn to the negative charge at cell surfaces**
- They bind heparan sulfate***
- This will alter local charge and erode the EZ water in that area, potentially causing severe disruption of ion transport at the cell surface****


Sulfur dysregulation is a sign of the times!

- Depleted soil
- Excess dietary sulfur due to year-round/non-seasonal vegetable supply
- Universal exposure to glyphosate and all the rest
Our Belief: Our Body Compensates In Important Ways

- Bodies must have a way of generating sulfate if the normal pathways aren’t open
- The “work arounds” our body utilizes cause symptoms, but are essential
- Simply killing off the bugs won’t work as a lasting solution
What if: Backup Plans

- Plan A: Sulfomucin production (acute need)
- Plan B: Sulfur-fixing bacteria (“pre-chronic” need)
- Plan C: Chronic inflammation (chronic need)
- Plan D: Cancer? (extreme local and/or systemic need)
Sulfomucins

- Ask: Bloated even when you haven’t eaten for a long time?
- Bacterial mucinase
  - *E. coli, Akkermansia muciniphila, Bacteroides thetaiotaomicron, Bifidobacterium bifidum*
- Inhibit with fenugreek seed powder, oregano, ginger
Sulfur-fixing Bacteria: The Crux of the Problem/Solution

<table>
<thead>
<tr>
<th>Helicobacter pylori</th>
<th>Enterobacter spp.</th>
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<tbody>
<tr>
<td>Desulfovibrio spp.</td>
<td>Bilophila wadsworthia</td>
</tr>
<tr>
<td>Campylobacter jejuni</td>
<td>Staphylococcus aureus</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>Streptococcus anginosus</td>
</tr>
<tr>
<td>Clostridium spp.</td>
<td>Klebsiella spp.</td>
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</tbody>
</table>
Chronic inflammation

- An inflammatory environment is needed to generate sulfate from SO$_2$
- This is proposed to happen in gout, encephalitis, IBD, and other inflammatory diseases
Cancer

- Tumors are factories cranking out sulfur compounds that the body can turn into sulfate.
  - Incidental stage I and II tumors may be supplying local sulfate deficits.
Therapeutic goals:

- Reduce sulfur and support its metabolism
- Bring in sulfate
- Enhance negative charge
- Hydrate
- Deal with autonomic issues!
Home therapies

- Epsom salt baths
- Supplements
  - Molybdenum, butyrate, IONbiome, IgG, GSH?, etc.
- Grounding
- Tepid showers
- Castor oil
- SSP, DNRS, Vagus nerve exercises
The Key Therapy:

- Low Sulfur Diet
  - Reduce the input
  - Increase the outflow
Overview of the Diet

- This is both diagnostic and detoxifying
- Eliminate acutely reactive sulfur foods
  - There are dozens of sulfur compounds in any given food
- Reducing total sulfur load
- Two weeks, give or take, then re-introductions
Be Prepared

- The “Sulfur Dump”
  - Things can get worse before they get better
  - Usually starts and ends within the first 5 days
Record Symptom Picture, Pre and Post

- Skin, brain fog, guts, sweats, fatigue, headaches, heart arrhythmias or palpitations, and everything else
Primary Eliminations

- Alliums, Brassica/Cruciferous, mustard greens, legumes, dairy and animal products
- Coffee, alcohol, fermented foods and drinks
- Foods with sulfur dioxide residue: frozen potatoes, dried coconut, dried fruit, grapes, corn husks (for tamales)
- Lemon/lime juice concentrates
Common Mistakes, Recurring Questions

- Not reading labels
- What substitutions?
- Can I have...?
- Why does this other diet allow/not allow...?
More Comments and Questions

- I thought these foods were good for me?
- Will I ever be able to eat ... again?
- If I make a mistake do I have to start over?
Ending the Process

→ Re-introductions are the gold
→ Distinguish acute from non-acute sensitivities
→ Diets should be as healthy and varied as possible
→ Reintroduction schedule varies but generally includes: garlic, onion, kale, egg, cabbage, broccoli, cauliflower
Thank You!