

Clinical Focus Topic *Caffeine & Urinary Sx*

BACKGROUND INFORMATION

For everyone who knows me personally (which is most of you!!), you are probably thinking that there is a conflict of interest I need to disclose here..... So let's start with that. YES, I have an extreme caffeine addiction. I am probably the only physiotherapist in Australia who works in women's health who virtually never drinks a glass of water. I have about 6-7 cups of tea and 1 coffee each day and that is my total fluid intake. If I go to bed without having a cup of tea I wake up with a headache, and if I don't have a cup of tea in the morning I have a headache by 10am.

What does this mean in terms of my opinion on advice we should give to women regarding caffeine?

I think it is true to say that my own caffeine addiction probably does influence what I say about caffeine, but I don't think it is in a bad way (but maybe I am biased in that opinion). The fact is that I know what it is like to have a caffeine addiction. A lot of people say they have a caffeine addiction but often it is just their way of saying they love having a coffee in the morning, when in reality they can go without it if they have to. My addiction however is real.

Why am I saying this?

I suppose I would like to give a very personal first-hand explanation to all of you who don't tend to drink caffeinated substances about how very "REAL" caffeine addiction can be. My caffeine addiction is as real as a smoking addiction, or an alcohol addiction. When we ask people to try to stop smoking we give nicotine patches, we understand that people withdrawing from alcohol can have numerous very dangerous physiological side effects during the process. In contrast, I think health professionals often take very lightly advice about cutting out caffeine. If I was to come to you as a patient and you gave advice for me to cut out caffeine completely you would make me extremely sick for at least a few days and I would be in an enormous amount of pain. My head would feel like it is going to explode. My whole neck would ache and I would struggle to get out of bed. I am being honest when I say that if I ever went into hospital for an operation I would realistically need to declare my caffeine addiction as I would have a physiological withdrawal.

Now, I am not necessarily saying this is good.... But I am saying it is real. Whilst obviously reducing caffeine is no big deal for some people, for others it is. If we are going to tell people to reduce caffeine who are likely to go through a physical withdrawal, we had better be sure that the research actually backs us up on this.

BACKGROUND INFORMATION ON CAFFEINE LEVELS

Gleason et al 2012 estimate that average caffeine levels in beverages are

➤ Coffee	95 - 206mg per 250ml	(average - 150mg)
➤ Tea	14 - 120mg per 250mls	(average - 65mg)
➤ Carbonated drinks	20 - 90mg per 375ml can	(average - 55mg)
➤ High Energy drinks	50 - 505mg/serve	(average - 275mg)

RESEARCH REVIEW

RESEARCH PAPER 1 *Is caffeine intake associated with urinary incontinence in Japanese Adults*

Authors Hirayama and Lee

Journal J Prev Med Public Health, 2012 May, vol 45 (3), pp. 204-208

Methods

N = 683 ♂ and 298 ♀ aged 40-75years

Results:

1. There was no statistically significant difference in the caffeine intakes of those who reported urinary incontinence to those who did not

	Men	Women
Caffeine Intake - Incontinent	120mg	94mg
Caffeine Intake - Not incontinent	106	103mg
	P = 0.33	P = 0.44

2. Those with the highest level of caffeine intake were found to have a slightly increased risk of incontinence compared to the lowest intake (36% increased risk for men and 12% increased risk for women), however this became not statistically significant after allowing for confounding factors.

Conclusion:

No association was evident between caffeine intake and UI in middle-aged older Japanese adults.

TARYN'S COMMENT

Notes:

The study above did not distinguish out stress incontinence from urgency or urge incontinence. In addition, the above study had fairly small numbers which makes it hard to reach statistical significance. Looking at the raw numbers it could be argued that there was more of an effect in men than women.

The next studies separate gender. This could be relevant as urgency and urge incontinence in men does have a much higher association with Detrusor Overactivity than urgency in women. Therefore, if caffeine is related to DO it would be expected to be more of an associated for male urgency incontinence than female urgency incontinence.

We will start by looking at caffeine intakes association with urinary incontinence in women simply because more research has been conducted in women.

Is caffeine intake a risk factor for women?

RESEARCH 2

Are smoking and other lifestyle factors associated with female urinary incontinence? The Norwegian EPINCOT Study*

Authors Hannestad YS, Rortveit G, Daltveit AK and Hunskaar S.
Journal British Journal of Obstetrics and Gynaecology

Background

The Norwegian EPINCOT Study (*EPINCOT = Norwegian Epidemiology of Incontinence in the County of Nord-Trøndelag) surveyed 27,936 women ≥ 20 years between 1995-1997. Questions covered smoking, BMI, physical activity, caffeine intake etc and their relationship with LUT disorders

2 Main Findings Related to Caffeine

- Tea Drinkers were at slightly higher risk for all types of incontinence
- No effect was found for consumption of alcohol or coffee

RESEARCH 3

Caffeine and Urinary Incontinence in US Women

Authors Gleason JL, Richter HE, Redden DT, Goode PS, Burgio KL and Markland AD
Journal International Urogynaecology Journal, February 2013

Background

The focus of this study was to characterise the association between caffeine consumption and severity of urinary incontinence in US women. Data was collected from the 2005-2006 and 2007-2008 National Health and Nutrition Survey and included 4,309 non-pregnant women aged >20 with complete data.

Caffeine Intake was categorised into quartiles (0-27mg/day; 28-95mg/day; 96-204mg/day; >204 mg/day)

Urinary Incontinence was categorised as either

1. Any urinary incontinence (including mild / drops / occasional) OR
2. Moderate / severe UI (defined as weekly incontinence or monthly incontinence of more than just drops)

Main Results

- Urinary Incontinence
 - 41.0% of women stated they experienced some degree of urinary incontinence
 - 16.5% of women stated they experienced moderate/severe urinary incontinence
- Caffeine Consumption
 - Average caffeine intake per day in women was 126.7mg
 - Caffeine intake in the highest quartile (>204 mg/day) was associated with
 - 1.4x the risk of "Any" urinary incontinence, but
 - No increased risk of moderate to severe urinary incontinence
 - Type of UI (Stress, urgency, mixed) was not associated with caffeine intake

Conclusion

Caffeine intake >204 mg/day was associated with any UI, but not with moderate to severe urinary incontinence in women.

But what if we look at urgency incontinence and stress incontinence in women separately?

RESEARCH 4

Caffeine intake, and the risk of stress, urgency and mixed urinary incontinence

Authors

Jura YH, Townsend MK, Curhan GS, Resnick NM, Grodstein F

Journal

Journal of Urology

Background

A prospective cohort study of 65,176 women aged 37-39 years.

Main Findings

- Overall caffeine consumption was not associated with urinary incontinence of monthly or more
- High Caffeine consumption greater than 450mg showed a modest increased risk of weekly urinary incontinence compared to the lowest caffeine consumption (less than 150mg) Relative Risk = 1.19
- The increased risk was predominantly focused on increased urgency incontinence at caffeine levels >450mg compared to <150mg Relative Risk 1.34,
- There was no increased risk for high caffeine consumption >450mg for stress or mixed urinary incontinence.

Conclusion

Only high caffeine intake >450mg (not low or moderate) is associated with increased incidence of urinary incontinence, and this association only applies to urgency urinary incontinence (moderate intake does not increase the risk). There is also no association with any level of caffeine intake and stress or mixed urinary incontinence.

Does Caffeine make urinary incontinence get worse over time??

RESEARCH 5

Caffeine intake and risk of urinary incontinence progression among women

Authors

Townsend MK, Resnick NM, Grodstein F

Journal

Obstetric Gynecology, 2012 vol 119, no. 5, pp. 950-957

Background

A prospective cohort study of 21,564 women with moderate UI.

Measures: Baseline Caffeine intake in the previous year
Change in caffeine intake over the previous four years
2 Years follow up of incidence of urinary incontinence

Main Findings

- The change in urinary incontinence progression was similar across categories of baseline caffeine intake and change in caffeine intake before baseline.
 - 21% of women with caffeine intake of 450mg or more had an increase in urinary incontinence
 - 22% of women with caffeine intake less than 150mg had an increase in urinary incontinence

Conclusion

Long term high level caffeine intake is not associated with an increased risk of progression of urinary incontinence.

WHAT ABOUT IN MEN??

RESEARCH 6

Caffeine and Urinary Incontinence in US Men

Authors

Davis NJ, Vaughan CP, Johnson TM, Goode PS, Burgio KL, Redden DT and Markland AD

Journal

Journal of Urology 2013, Jun, vol 189, pp. 2170

Background

Whilst research has previously looked at the association between urinary incontinence and caffeine in women, little has been done on the association between UI and caffeine in men. The focus of this study was to characterise the association between caffeine consumption and severity of urinary incontinence in US men. Data was collected from the 2005-2006 and 2007-2008 National Health and Nutrition Survey and included 3,960 men aged 20yrs or older

Urinary Incontinence was categorised as

3. Any urinary incontinence OR
4. Moderate / severe UI defined was classified as scoring >3 on a standardized Incontinence Severity Index.

Main Results

➤ Urinary Incontinence

- 12.9% of men stated they experienced some degree of urinary incontinence
- 4.4% of men stated they experienced moderate/severe urinary incontinence

➤ Caffeine Consumption

- Average caffeine intake per day was 169mg/day
- Caffeine intake in the
 - >234mg/day was associated with 1.72x the risk of mod-severe urinary incontinence
 - >392mg/day was associated with 2.08x the risk of mod-severe urinary incontinence

Conclusion:

In men, caffeine consumption equal to or greater than 2 cups of coffee per day was significantly associated with moderate to severe urinary incontinence

High caffeine consumption appears to have a stronger relationship to moderate to severe urinary incontinence in men than women.... This could be due to the fact that urge urinary incontinence has a fairly low association with detrusor overactivity in women in the first place.

So is it related to detrusor overactivity??

RESEARCH 7

Dietary Caffeine and the risk for detrusor instability: a case control study

Authors

Arya LA, Myers DL and Jackson ND

Journal

Obstetrics and Gynaecology, 2000 July, vol 96, no. 1, pp 85-89

Background

The focus of this study was to determine whether there is an association between caffeine intake and detrusor overactivity. All women in the study had urinary incontinence, however half also had urodynamically proven detrusor overactivity and half did not. Comparison was made between the caffeine intake of the 131 women with 'UI + DO' vs the caffeine intake of the 128 women with urinary incontinence but no detrusor overactivity. All women had a maximum urethral closure pressure on urodynamics >20cmH₂O to rule out UI from intrinsic sphincter deficiency.

Caffeine Intake was classified as either

- | | | |
|------------|-----------------|---|
| - Minimal | < 100mg / day | (~1-2 caffeinated drinks per day – depending on caffeine level) |
| - Moderate | 100-400mg / day | (~1-6 caffeinated drinks per day –depending on caffeine level) |
| - High | >400mg / day | (>5 caffeinated drinks per day – depending on caffeine level) |

Main Findings

- There was a statistically significant association between high caffeine intake and detrusor overactivity
 - OR = 2.4 p =0.018 (ie women with high caffeine were 2.4x more likely to have DO)
- Average caffeine intake of women with UI + DO (484mg) was significantly higher than the average caffeine intake of those with urinary incontinence without DO (194mg) p = 0.002
- Women with minimal caffeine intake had slightly lower risk of DO than those with moderate caffeine intake, but this did not reach statistical significance (p=0.093)

Women can have a range of aetiologies underpinning their urgency incontinence. It may be that when the urgency is known to be associated with DO that caffeine may be a factor, but when the urgency is related to other factors caffeine intake becomes irrelevant?

SO DOES REDUCING CAFFEINE ACTUALLY MAKE A DIFFERENCE?

INTERVENTION STUDIES

RESEARCH 8

Caffeine Reduction Education to improve urinary symptoms (Australian Study)

Authors

Bryant CM, Dowell CJ and Fairbrother G

Journal

British Journal of Nursing, 2002, vol 11, no. 8, 560-565

Background

This was a randomised controlled trial of 95 consecutive adult patients (male and female) presenting to two nurse continence advisers. Treatment group underwent 1month trial of bladder training plus reduction of caffeine to less than 100mg, compared to control group who received bladder training only.

Frequency, urgency and leakage outcomes were tested 1month post-enrolment.

Main Findings

- *Caffeine reduction* resulted in a statistically significant reduction in symptoms of urgency ($p=0.002$) and frequency ($p = 0.037$) when compared to the control group.
- Caffeine reduction resulted in no difference for incontinence episodes

QUESTION/ THINKPOINT

BUT WAS IT THE REDUCTION IN CAFFEINE OR JUST A REDUCTION IN FLUID

RESEARCH 9

The impact of fluid intake on urinary symptoms in women

Authors

Swithinbank, Hashim and Abrams

Journal

Journal of Urology, 2005, vol 174, no. 1, 187-9

Background

This was a 4 week randomised, prospective crossover study that followed 69 women with either urodynamic stress incontinence ($n = 39$) or urodynamically proven detrusor overactivity ($n = 30$) whilst implementing caffeine restriction and fluid manipulation.

Main Findings

- **Detrusor Overactivity Group**
 - *Reduction in fluid intake* resulted in significantly decreased urgency, frequency and incontinence episodes, and a statistically significant increase in quality of life.
 - *Change from caffeinated to decaffeinated* resulted in no change in symptoms
- **Stress Incontinence Group**
 - *Reduction in fluid intake* resulted in a significant decrease in incontinence episodes
 - *Change from caffeine to decaffeinated* produced no change in symptoms

Final Study....

RESEARCH 10

Dietary caffeine, fluid intake and urinary incontinence in older rural women

Authors

Tomlinson BU, Dougherty MC, Pendergast JG, Boyington AR, Coffman MA, Pickens SM

Journal

International Urogynaecology Journal of Pelvic Floor Dysfunction

Background

41 women with urinary incontinence had nurse home visits with the most common recommendation being to decrease caffeine intake and increased fluid intake.

Main Findings

- **Decreased Caffeine** resulted in a non-significant reduction in incontinence episodes $p = 0.074$
- **Increased fluid intake** only resulted in an increase in average volume voided $p = 0.0479$

Taryn's Note – the non-significance ($p > 0.05$) could simply be because of the small numbers in the trial though.

TARYN'S SUMMARY

There appears to be fairly consistent research showing an association between caffeine and detrusor overactivity. Whilst there is no evidence that caffeine causes detrusor overactivity it may worsen detrusor overactivity in those already affected.

Whilst caffeine may be related to detrusor overactivity, the inconsistent research on whether DO is actually related to LUT symptoms makes this finding less clinically relevant. The more important association is whether caffeine relates to symptoms.

There does not appear to be any link between caffeine intake and stress incontinence.

There is only one trial on caffeine intake specifically in men – which seems to show a fairly strong association with symptoms. As male urge incontinence has a much stronger relationship to detrusor overactivity this is a logical result.

There seems to be little evidence that there is an association between general urinary incontinence and caffeine intake in women. However, these generalised results are probably diluted due to the high number of women whose urinary incontinence is actually SUI. In addition, women have a much more multivariate nature to their urge urinary incontinence (not being always related to DO). It is therefore not surprising that the research seems to come out less strong in women than it does in men.

If there is an association between urge incontinence and caffeine in women it only appears to be at very high levels of caffeine consumption. There appears to be no increased risk at moderate intake vs low intake. A woman presenting with a caffeine intake of 1-2 cups per day really has no increased risk compared to no caffeine intake.

There is only one small trial that indicates a reduction in caffeine may help symptoms – and even then the reduction in symptoms is with reference to urgency but not urge incontinence. In addition, it could be argued that the reduction in symptoms in women is more related to a reduction in fluid intake than necessarily a reduction in caffeine.

Finally, there appears to be no evidence that people who consume caffeine will have a worsening of their condition at a faster rate than people who do not consume caffeine.

WHAT'S THE UPSHOT OF ALL THIS..... In some people there is a link between caffeine and symptoms. It is definitely worthwhile to trial a reduction in caffeine and see if there is an improvement in symptoms. But we may not need to be as militant on caffeine as we sometimes think.