

Association of Catechu nut chewing with risk for erectile dysfunction

Bang-Ping Jiann, MD
Kaohsiung Veterans General Hospital, Kaohsiung
National Yang-Ming University, Taipei
Taiwan

Introduction

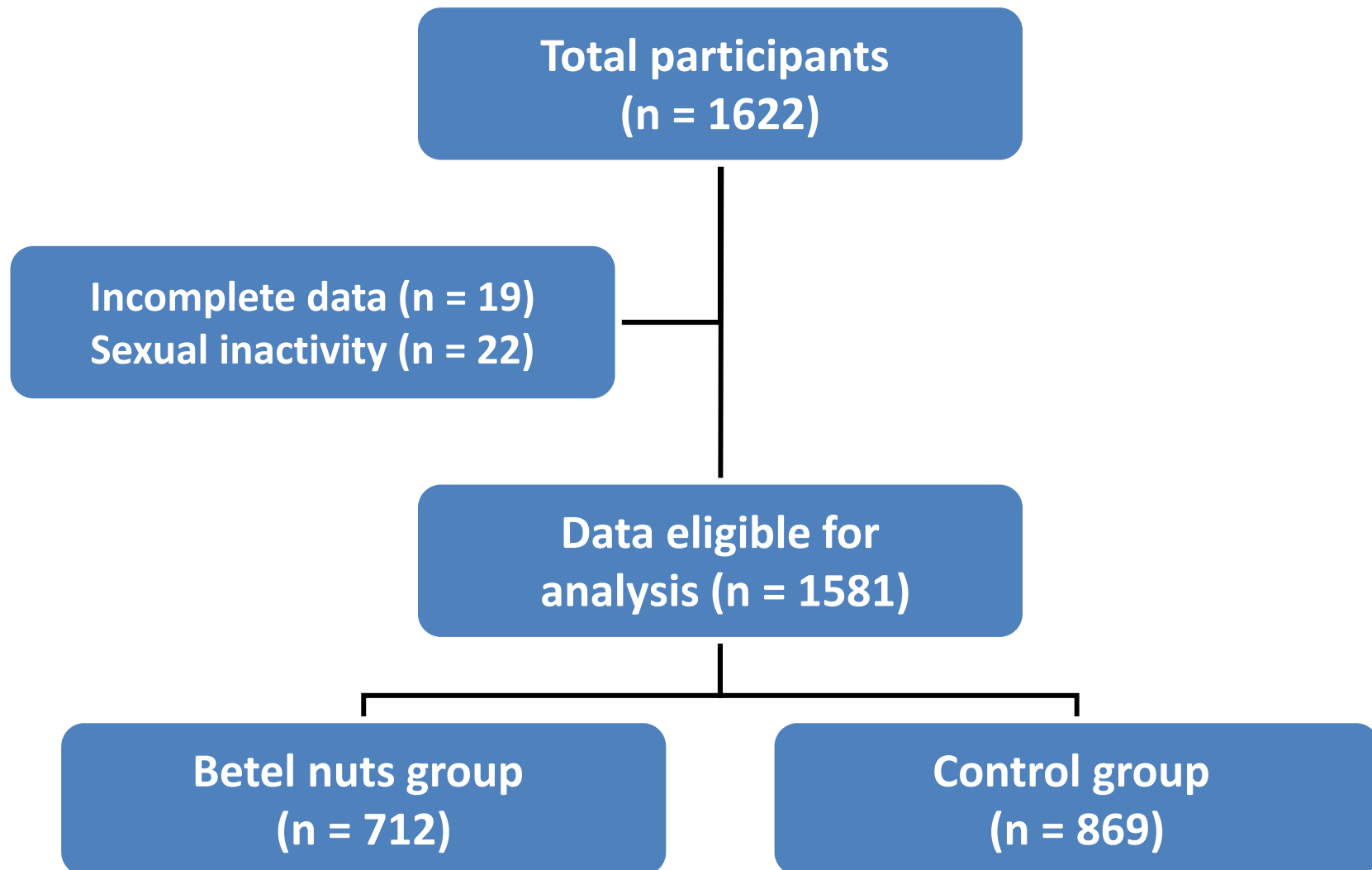
- Areca nut is the seed of the fruit of *Areca catechu*
- The 4th most commonly used drug worldwide, after tobacco, alcohol, and caffeine
- Mixed with a variety of substances, slaked lime (calcium hydroxide) in red or white color
- Wrapped with betel leaf or not
- Health problems of chewers: oral mucous fibrosis and oral cancer, G-I tract malignancy, diabetes, metabolic syndrome, obesity and early mortality



Materials and Methods

- Fee screening for oral malignancy in Provincial Public Health Centers between 2010 and 2011
- Subjects with age between 40 to 70 years were invited to answer the questionnaire without any compensation
- Institutional Review Board approved the study protocol

Flow diagram of study participants



Demographic data of betel nut group and control

	Areca nut group (n = 712)	Controls (n = 869)	P value
Age, yrs	50.2 ± 7.4 (40–70)	51.3 ± 7.9 (40–70)	0.002
Body mass index. kg/m²	25.2 ± 3.3 (16.9–39.5)	24.7 ± 3.0 (16.5–39.8)	0.007
Married	85.7% (570)	91.4% (745)	0.002
Smoking habit			<0.001
<i>Current smoker</i>	60.7% (427)	25.8% (222)	
<i>Ex-smoker</i>	17.5 % (123)	15.3% (132)	
<i>Nonsmoker</i>	21.8 % (153)	58.8% (506)	
Drinking habit			<0.001
<i>Everyday</i>	14.2% (100)	3.1% (27)	
<i>Often</i>	20.7% (146)	5.5 % (47)	
<i>Rarely</i>	49.3% (347)	41.2% (355)	
<i>Never</i>	15.8% (111)	50.2 % (433)	
Hypertension	32.1 % (225)	23.7% (204)	<0.001
Diabetes mellitus	12.9 % (90)	8.5% (73)	0.005
Dyslipidemia	11.6% (81)	8.5% (73)	0.042
Chronic liver disease	6.0% (42)	5.2% (45)	0.508

Characteristics of participants who had a habit of areca nut chewing

Areca nut chewing habit (n=712)	Results
Duration of areca nut chewing, yr	15.3 ± 10.3 (0.5–50)
Daily unit consumption, % (n)	
< 10	40.3% (255)
11–20	31.9% (202)
21–50	21.0% (133)
51–100	5.2% (33)
> 100	1.6% (10)
Habit of chewing, % (n)	
Current chewer	77.9% (555)
Ex-chewer	22.1% (157)
Preferred preparation of areca nut, %(n)	
With betel leaf	75.7% (476)
With inflorescence	16.9% (106)
Both	7.5% (47)

Comparison of erectile function between catechu nut group and control

Sexual Health Inventory for Men	Catechu nut group (n = 712)	Controls (n = 869)	P-value
Total score of SHIM*	19.1 ± 5.4 (1–25)	20.3 ± 4.7 (1–25)	<0.001
Prevalence of ED	62.4% (444)	51.4% (447)	<0.001
<i>Mild ED</i>	37.4% (266)	34.4% (299)	
<i>Mild to moderate ED</i>	13.8% (98)	11.0% (96)	
<i>Moderate ED</i>	5.6% (40)	3.2% (28)	
<i>Severe ED</i>	5.6% (40)	2.8% (24)	

Dose-dependent effect of chewing

- Subjects who had chewed catechu nut for > 3 yrs reported a higher prevalence of ED (65.8% [373/567]) than those for ≤ 3 yrs (51.5% [34/66]) ($p = 0.022$).
- The risk of ED significantly increased when cumulative exposure of catechu nut chewing reached 27.5 ($p = 0.001$)

Cumulative exposure :
the duration (yrs) x daily consumption) in the receiver
operating characteristic (ROC) curve

Odds ratio for comorbidities for subjects with a history of areca nut chewing

Comorbid	OR* (95% CI)	<i>p</i> -value
Erectile dysfunction	1.72 (1.36–2.18)	<0.001
Diabetes mellitus	1.60 (1.10–2.33)	0.014
Hypertension	1.46 (1.12–1.89)	0.005
Obesity [#]	1.31 (1.00–1.71)	0.048
Dyslipidemia	1.23 (0.85–1.79)	0.273

*Logistic Regression after adjustment for age, smoking, and drinking habit, *P* <0.05

[#] Body mass index ≥ 27.0 kg/m²

Pathophysiology

- Arecol alkaloids act as inhibitors of γ -aminobutyric acid receptor (GABA). Blockade of GABA stimulates the secretion of glucagon and subsequently in the development of diabetes
- Sympathetic nervous system activation
- Reactive oxygen species and *N*-nitroso compounds release during chewing: increased the release of inflammatory mediators including prostanooids, interleukin-6 and tumor necrosis factor- α
- Combined with smoking and drinking habit

Conclusions

- In addition to obesity and diabetes, Areca nut chewing increased the risk of ED with a dose-dependent effect.
- Campaign for Quitting chewing and avoidance of such habit is warranted for men's cardiovascular health.

您好！高雄榮總與本衛生所合作共同調查國人性健康，採不記名作答，結果只供學術研究，請在最符合您情況的選項內打【V】。
若有任何問題，歡迎電 07-3422121 轉 3010 高雄榮總簡邦平醫師。謝謝您的參與，祝您 身體健康。

1. 您_____歲 身高_____公分 體重_____公斤
2. 婚姻：【】已婚 【】離婚或喪偶 【】未婚
3. 您身體有下列哪些疾病 (可複選)？
- 【】高血壓 【】糖尿病 【】血脂肪異常
- 【】慢性肝病 【】腦中風 【】冠狀動脈疾病
- 【】尿毒症 【】憂鬱症
- 【】癌症：_____ (請說明器官或系統)
- 【】以上都沒有

4. 抽菸史

- 【】有抽菸習慣，每天抽_____包，已經抽_____年
- 【】已戒菸，過去曾經抽_____年
- 【】不抽菸

5. 飲酒習慣

- 【】每天都要喝，已經喝_____年
- 【】經常喝，已經喝_____年
- 【】偶爾喝
- 【】不喝酒

6. 吃檳榔習慣

- (1) 【】習慣吃，已經吃_____年
- 【】偶爾吃，已經吃_____年
- 【】已戒掉，曾經吃_____年
- 【】不吃檳榔
- (2) 平均一天吃多少粒？(不吃檳榔者不須回答)？
- 【】10 粒以下 【】11~20 粒 【】21~50 粒
- 【】51~100 粒 【】100 粒以上
- (3) 最常吃的種類？(不吃檳榔者不須回答)？
- 【】包葉
- 【】菁仔

7. 您認為自己有勃起功能障礙 (俗稱陽痿) 嗎？

- 【】沒有₁
- 【】有₂

8. 在最近三個月內，您性行為 (包括性交與手淫) 的平均頻率

- 【】每週 2 次以上₁
- 【】每週 1~2 次₂
- 【】每月 1~4 次₃
- 【】每月少於 1 次₄
- 【】沒有性行為₀

9. 請根據您過去六個月的經驗回答下列 5 個問題：

(1) 在嘗試行房中，您能夠達成陰莖勃起並且維持勃起的信心程度如何？

非常低	低	中度	有信心
【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】

(2) 受到性刺激時，陰莖勃起硬度足夠 (進入伴侶體內) 的次數如何？

沒有性行為	幾乎完全不可以	少數幾次可以	約一半可以	大多數可以
【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】

(3) 在嘗試行房中，陰莖進入伴侶體內後仍能維持勃起的次數如何？

沒有性行為	幾乎完全不可以	少數幾次可以	約一半可以	大多數可以
【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】

(4) 在嘗試行房中，您維持陰莖勃起直到完成行房有多困難？

沒有性行為	極度困難	非常困難	困難	有點困難
【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】

(5) 在嘗試行房中，您可以感覺滿意的次數如何？

沒有性行為	幾乎完全不可以	少數幾次可以	約一半可以	大多數可以
【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】	【 <input type="checkbox"/> 】

Comparison of subjects with ED vs. without ED among 707 subjects with areca nut chewing

	ED (n = 444)	No ED (n = 268)	p-value
Age, yrs	51.4 ± 7.5 (40–70)	47.9 ± 6.5 (40–69)	<0.001
Body mass index, kg/m²	25.1 ± 3.4 (16.9–39.5)	25.3 ± 3.1 (18.0–36.5)	0.380
Duration of chewing, yr	16.1 ± 10.8 (1.0–50.0)	13.7 ± 9.1 (0.5–40.0)	0.002
Daily consumption, portions/day			0.798
< 10	39.9% (157)	40.8% (98)	
11–20	33.6% (132)	29.2% (70)	
21–50	19.8% (78)	22.9% (55)	
51–100	5.1% (20)	5.4% (13)	
> 100	1.5% (6)	1.7% (4)	
Preferred preparation			0.006
<i>With betel leaf</i>	71.6% (275)	82.0% (201)	
<i>With inflorescence</i>	20.6% (79)	11.0% (27)	
<i>Both</i>	7.8% (30)	6.9% (17)	
Comorbidities			
<i>Hypertension</i>	37.8% (166)	22.6% (59)	<0.001
<i>Diabetes mellitus</i>	15.9% (70)	7.7% (20)	0.002
<i>Dyslipidemia</i>	13.9% (61)	7.7% (20)	0.013
<i>Chronic liver disease</i>	7.1% (31)	4.2% (11)	0.125