Journal Club

引言人:王錦雲

日期:2016年06月07日

Association Between Rotating Night Shift Work and Risk of Coronary Heart Disease Among Women

Céline Vetter, PhD; Elizabeth E. Devore, ScD; Lani R. Wegrzyn, ScD; Jennifer Massa, ScD; Frank E. Speizer, MD; Ichiro Kawachi, MD, ScD; Bernard Rosner, PhD; Meir J. Stampfer, MD, DrPH; Eva S. Schernhammer, MD, DrPH

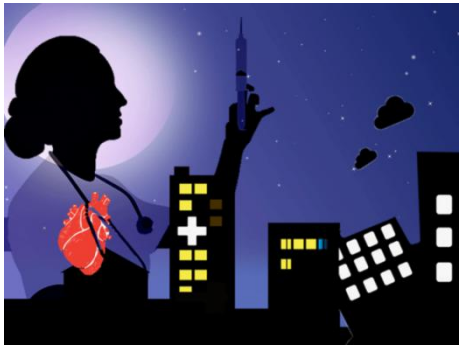
JAMA The Journal of the American Medical Association (J Am Med Assoc)

Publisher: American Medical Association, American Medical Association (AMA)

Journal description

JAMA, which began publication in 1883, is an international peer-reviewed general medical journal. Key objective is to promote the science and art of medicine and the betterment of the public health.

Current impact factor: 35.29



前言

- In 1995, Kawachi et al 7 examined the association between rotating night shift work and CHD in the Nurses' Health Study (NHS) over 4 years of follow-up and reported a 51% significant increase in CHD risk (nonfatal MI and CHD death) among women with more than 6 years of rotating night shift work after multivariable adjustment.

- This study reassessed the association of rotating night shift work and coronary health in the Nurses' Health Studies (NHS and NHS2) with 24 years of follow-up and examined manifestations of CHD.

A.研究結果可信嗎?

是

1. 研究問題是否清楚且聚焦?

- 研究族群 (population)
  --女性護理人員
- 介入措施(Intervention)
  --輪值夜班
- 比較措施((Comparison)
  --未輪值夜班
- 結果(Outcomes)
  --Incident CHD; nonfatal myocardial infarction, CHD death, angiogram-confirmed angina pectoris, coronary artery bypass graft surgery, stents, and angioplasty.

- 研究是否試圖檢測有利或有害的效果? 是

註: definition of rotating night shift work:
≥3 night shifts per month

2.以可接受的方式招募受試者(世代)嗎?

- 所選擇的世代是否能代表特定的族群? 是
- 所選擇的世代有無特殊性? 是
- 所有應該收案的對象都已納入? 是

是

Nurses' Health Studies (NHS and NHS2)

資料庫	收集年限	人數	對象	年齡
NHS	自1976年~	121701人	註冊護士	30~50歲
NHS2	自1989年~	116430人	註冊護士	25~42歲

Study Population

The NHS and NHS2 are ongoing, prospective cohort studies. The NHS began in 1976 when 121 701 female registered US nurses aged 30 to 55 years responded to a baseline questionnaire.[9] The NHS2 started in 1989 and included 116 430 female registered US nurses aged 25 to 42 years. In both cohorts, biennial follow-up

3.是否準確測量暴露的變項，以減少偏差?

- 研究者用主觀或客觀的測量? 以問卷資料為主

- 該測量是否真實反應原來想要測量的變項
  (測量是否經過信效度驗證)? 不明確
  --暴露於夜班的定義未明確查證，均由個案問卷得知

- 所有受試者以相同的程序分派至不同暴露的組別
  --不明確

不明確

4.結果測量是否精確以減少偏差?

Ascertainment of CHD

On baseline and follow-up questionnaires, participants were asked to report physician-diagnosed CHD events. Those who reported nonfatal MI were asked for medical record access so that exposure-blinded physicians could confirm self-reported nonfatal MI. Nonfatal MI was confirmed using the World Health Organization criteria, which required diagnostic electrocardiographic findings or elevated enzyme levels in addition to typical symptoms.[10] Participant deaths were identified through the National Death Index, next of kin, or postal authorities, with primary cause of death being determined by autopsy reports, hospital records, and death certificates. The primary outcome was incident CHD, including self-reported cases of CABG surgery, angina pectoris (confirmed by angiogram), angioplasty, and coronary artery stents, in addition to nonfatal MI and CHD death (including fatal MI), whichever came first. Secondary analyses were restricted to nonfatal MI and CHD death.

- 他們使用主觀或客觀的測量方式?主觀
- 研究者用主觀或客觀的測量? 主觀
- 是否已建置可靠的系統以檢測所有的個案 (用於測量疾病的發生)? 不明確
- 不同組別的測量方式是否相似? 相似
- 個案和/或結果的評估員是否盲化(有無盲化是否有影響)? 有盲化

不明確

5. (a)研究者是否釐清所有重要的干擾因素?

The following cardiovascular disease risk factors were included in multivariable-adjusted models: family history of MI before age 60 years, diet quality (Alternative Healthy Eating Index,[12] without the alcohol and multivitamin components, in quintiles), physical activity (metabolic equivalent task-hours per week, in quintiles), body mass index (BMI, calculated as weight in kilograms divided by height in meters squared: <25, 25-29, 30-35, or >35), cumulative pack-years smoked (continuous), alcohol intake (none, 0.1-5, 5.1-10, 10.1-20, or >20 g/d), parity (nulliparous, 1, 2, or ≥3 children), menopausal status (premenopausal or postmenopausal), hormone therapy (premenopausal, ever, or never), race (white, black, or other), husband's highest educational level (high school diploma or less, college degree, or graduate school level or similar), multivitamin use (yes or no), acetaminophen use (yes or no), nonsteroidal anti-inflammatory drug use (yes or no), aspirin use (yes or no), hypertension (yes or no), diabetes (yes or no), and hypercholesterolemia (yes or no). In additional analyses, models were adjusted for sleep duration (<6, 6-7, 8-9, or ≥10 hours per day) and social support (yes or no).

尚須對於輪班工的的時數、兩組工作負荷量、於研究期間，對於個案的輪班間距與頻率尚未考量

否

5.(b)研究者在研究設計和/或分析時是否考量干擾因素?

(ie, midpoint of categories) by time in all models, and its significance was evaluated using the Wald statistic. In sensitivity analyses, the outcome was restricted to nonfatal MI and CHD death. Additional sensitivity analyses were restricted to participants with no baseline history of major comorbidities potentially mediating CHD (ie, diabetes, hypertension, and hypercholesterolemia) and censored women who reported any of these conditions throughout follow-up.

(p1730)

是

6. (a)研究對象的追蹤夠完整?

是

- (b)研究對象的追蹤時間夠久?

signs across studies.[8] The present study reassessed the association of rotating night shift work and coronary health in the Nurses' Health Studies (NHS and NHS2) with 24 years of follow-up and examined manifestations of CHD (angiogram-confirmed angina pectoris, coronary artery stents, angioplasty, and coronary artery bypass graft [CABG] surgery), in addition to nonfatal MI and CHD death. Additionally, possible differences in this association over time, including effects of time since quitting shift work, were explored. The

7.研究結果為何?

Table 1. Age and Age-Adjusted Characteristics of Participating Women at Baseline by Rotating Night Shift Work History[a]

Characteristics	Rotating Night Shift Work Exposure (≥3 Night Shifts Per Month)							
	NHS (1988)				NHS2 (1989)			
	None (n=30 012)	<5 y (n=30 122)	5-9 y (n=4955)	≥10 y (n=8534)	None (n=43 657)	<5 y (n=56 179)	5-9 y (n=9866)	≥10 y (n=5833)
Age, mean (SD), y	54.0 (7.1)	54.3 (7.1)	54.9 (7.1)	56.2 (6.9)	34.8 (4.7)	34.5 (4.7)	35.1 (4.2)	37.1 (3.6)
White race, No. (%)	29 390 (98)	29 424 (98)	4832 (98)	8250 (97)	42 075 (96)	53 501 (95)	9337 (95)	5479 (95)
Parity, No. (%)								
Nulliparous	1434 (5)	1795 (6)	351 (7)	539 (6)	12 111 (28)	17 814 (31)	3440 (36)	1795 (37)
1 or 2 children	10 415 (34)	10 650 (35)	1761 (36)	2853 (35)	23 249 (53)	28 704 (51)	4889 (50)	2926 (48)
≥3 children	17 750 (60)	17 211 (57)	2743 (55)	4956 (57)	8290 (19)	9653 (18)	1536 (15)	1109 (16)
Parental history of MI at age <60 y, No. (%)	4893 (16)	5081 (17)	879 (18)	1516 (18)	6105 (14)	8294 (15)	1670 (17)	1011 (16)
Body mass index, mean (SD)[b]	25.2 (4.8)	25.4 (4.8)	26.0 (5.3)	26.6 (5.4)	23.9 (4.9)	24.0 (5.0)	24.8 (5.5)	25.1 (5.8)
No. (%)								
<25	18 206 (61)	17 910 (59)	2683 (54)	4242 (50)	31 400 (72)	39 851 (71)	6365 (65)	3420 (62)
25-29.9	7926 (27)	8107 (27)	1455 (29)	2559 (30)	7693 (18)	10 300 (18)	2068 (21)	1330 (22)
30-34.9	2645 (9)	2877 (10)	545 (11)	1116 (13)	2837 (7)	3723 (7)	853 (9)	606 (9)
≥35	1235 (4)	1228 (4)	272 (6)	617 (7)	1727 (4)	2305 (4)	580 (6)	477 (7)
Pack-years of smoking, median (IQR)[c]	18 (7-34)	18 (6-34)	20 (7-35)	24 (10-39)	10 (5-16)	9 (5-16)	10 (5-17)	11 (6-19)
Husband holds graduate school degree, No. (%)	5841 (19)	6346 (21)	840 (17)	1028 (12)	9351 (21)	13 810 (25)	2079 (21)	1090 (18)
Alcohol intake, median (IQR), g/d[d]	1.8 (0-7.6)	1.9 (0-8.3)	1.8 (0-7.3)	1.1 (0-6.2)	0.9 (0-3.1)	0.9 (0-3.7)	0.9 (0-3.6)	0.9 (0-2.9)
Alternative Healthy Eating Index score (2010), mean (SD)[e]	45.7 (10.5)	46.0 (10.4)	46.0 (10.3)	45.3 (10.1)	43.6 (10.5)	44.3 (10.5)	44.2 (10.4)	44.1 (10.3)

Table 1. Age and Age-Adjusted Characteristics of Participating Women at Baseline by Rotating Night Shift Work History[a]

Characteristics	Rotating Night Shift Work Exposure (≥3 Night Shifts Per Month)							
	NHS (1988)				NHS2 (1989)			
	None (n=30 012)	<5 y (n=30 122)	5-9 y (n=4955)	≥10 y (n=8534)	None (n=43 657)	<5 y (n=56 179)	5-9 y (n=9866)	≥10 y (n=5833)
Physical activity, median (IQR), MET-hours/wk[f]	7.9 (2.9-20.2)	9.1 (3.4-20.9)	9.0 (3.4-21.5)	8.4 (3.2-21.5)	12.3 (4.7-27.4)	14.6 (5.5-31.6)	15.1 (5.8-33.3)	14.2 (5.2-32.1)
Multivitamin use, No. (%)	18 518 (62)	19 011 (63)	3148 (64)	5325 (62)	23 704 (54)	30 053 (54)	5254 (53)	3242 (55)
Aspirin use, No. (%)	18 482 (62)	19 105 (63)	3122 (63)	5374 (63)	4747 (11)	6119 (11)	1195 (12)	827 (13)
NSAID use, No. (%)	9537 (31)	9680 (32)	1575 (32)	2728 (33)	7775 (18)	10 986 (20)	2206 (22)	1409 (22)
Acetaminophen use, No. (%)[g]	11 110 (37)	11 315 (37)	1849 (38)	3204 (39)	9229 (21)	12 370 (22)	2292 (23)	1529 (26)
Postmenopausal, No. (%)	20 735 (71)	21 254 (71)	3674 (72)	6866 (74)	965 (2)	1271 (2)	247 (2)	238 (3)
Current hormone therapy, No. (%)	6833 (23)	7059 (24)	1122 (22)	1868 (21)	997 (2)	1263 (2)	246 (2)	236 (3)
Self-reported hypertension, No. (%)	7464 (25)	7641 (26)	1448 (29)	2781 (30)	2270 (5)	2938 (5)	627 (6)	460 (7)
Self-reported diabetes, No. (%)	1048 (4)	995 (3)	221 (4)	507 (6)	396 (1)	402 (1)	74 (1)	68 (1)
Self-reported hypercholesterolemia, No. (%)	6683 (23)	6837 (23)	1171 (23)	2781 (24)	4493 (10)	5809 (10)	1100 (11)	722 (11)
Usual sleep duration, No. (%), h[h]								
≤6	6978 (23)	7506 (25)	1427 (29)	2901 (34)	8939 (20)	12 230 (22)	2542 (26)	1670 (28)
7	11 299 (38)	11 353 (38)	1770 (36)	2609 (31)	13 835 (32)	17 397 (31)	2779 (28)	1552 (26)
8-9	7661 (26)	7358 (24)	1044 (21)	1709 (19)	9593 (22)	11 178 (20)	1680 (17)	892 (16)
≥10	157 (1)	132 (0)	24 (0)	56 (1)	245 (1)	322 (1)	52 (1)	37 (1)
Social support, No. (%)[i]	22 288 (94)	22 667 (94)	3617 (93)	6019 (94)	31 370 (94)	39 389 (95)	6822 (95)	3930 (94)

Table 2. Shift Work and Risk of Coronary Heart Disease in the NHS[a]

Cohort	Baseline History of Rotating Night Shift Work[b]				*P* Value for Trend[c]	*P* Value for Interaction, Shift Work × Time[d]
	None	<5 y	5-9 y	≥10 y		
Overall NHS, 1988 to 2012						
Cases/person-years	2739/643 774	2857/644 857	568/103 574	1139/173 571		
Incidence rate per 100 000 person-years (95% CI)[e]	425.5 (383.9-467.1)	435.1 (392.8-477.5)	525.7 (410.4-641.1)	596.9 (502.1-691.7)		
Age-adjusted model, HR (95% CI)	1 [Reference]	1.02 (0.96-1.07)	1.21 (1.11-1.33)	1.36 (1.27-1.46)	<.001	
Multivariable-adjusted model, HR (95% CI)[f]	1 [Reference]	1.02 (0.97-1.08)	1.12 (1.02-1.22)	1.18 (1.10-1.26)	<.001	<.001

Table 2. Shift Work and Risk of Coronary Heart Disease in the NHS[a]

Cohort	Baseline History of Rotating Night Shift Work[b] None	<5 y	5-9 y	≥10 y	*P* Value for Trend[c]	*P* Value for Interaction, Shift Work × Time[d]
First vs second half of follow-up						.02
June 1988 to May 2000						
Cases/person-years	915/351 568	1021/352 490	213/57 612	455/97 899		
Incidence rate per 100 000 person-years (95% CI)[e]	367.3 (302.4-432.3)	382.4 (316.8-448.1)	483.1 (306.6-659.7)	494.4 (370.1-618.8)		
Multivariable-adjusted model, HR (95% CI)[f]	1 [Reference]	1.10 (1.01-1.21)	1.19 (1.03-1.39)	1.27 (1.13-1.42)	<.001	.03
June 2000 to May 2012						
Cases/person-years	1824/305 036	1836/305 297	355/48 238	684/79 819		
Incidence rate per 100 000 person-years (95% CI)[e]	436.6 (367.8-505.4)	424.8 (361.8-487.7)	520.7 (377.1-664.3)	556.2 (414.2-754.3)		
Multivariable-adjusted model, HR (95% CI)[f]	1 [Reference]	0.98 (0.92-1.05)	1.08 (0.96-1.21)	1.13 (1.04-1.24)	.004	.08

Table 2. Shift Work and Risk of Coronary Heart Disease in the NHS[a]

Cohort	Baseline History of Rotating Night Shift Work[b]				*P* Value for Trend[c]	*P* Value for Interaction, Shift Work × Time[d]
	None	<5 y	5-9 y	≥10 y		
Restricted to myocardial infarction and coronary heart disease death						
June 1988 to May 2000						
Cases/person-years	443/353 659	491/354 846	117/58 026	226/99 022		
Incidence rate per 100 000 person-years (95% CI)[e]	173.0 (128.3-217.8)	182.3 (137.2-227.4)	276.2 (142.6-409.9)	236.5 (151.8-321.3)		
Multivariable-adjusted model, HR (95% CI)[f]	1 [Reference]	1.12 (0.99-1.28)	1.35 (1.10-1.66)	1.29 (1.09-1.51)	.001	.19
June 2000 to May 2012						
Cases/person-years	444/316 989	428/318 083	65/50 714	176/84 689		
Incidence rate per 100 000 person-years (95% CI)[e]	106.6 (73.1-140.0)	92.3 (69.1-115.5)	101.5 (36.4-166.5)	133.3 (76.4-190.1)		
Multivariable-adjusted model, HR (95% CI)[f]	1 [Reference]	0.95 (0.83-1.09)	0.77 (0.60-1.00)	1.09 (0.91-1.30)	.84	.56

Table 3. Shift Work and Risk of Coronary Heart Disease in the NHS2[a]

Cohort	Rotating Night Shift Work Exposure				*P* Value for Trend[b]	*P* Value for Interaction, Shift Work × Time[c]
	None	<5 y	5-9 y	≥10 y		
Baseline history of shift work[d]						
Cases/person-years	1236/1 007 860	1673/1 296 585	347/226 580	263/132 971		
Incidence rate per 100 000 person-years (95% CI)[e]	122.6 (105.0-140.3)	130.6 (114.5-146.7)	151.6 (109.2-194.0)	178.0 (123.0-234.0)		
Age-adjusted model, HR (95% CI)	1 [Reference]	1.06 (0.99-1.14)	1.22 (1.08-1.38)	1.34 (1.17-1.53)	<.001	
Multivariable-adjusted model, HR (95% CI)[f]	1 [Reference]	1.05 (0.97-1.13)	1.12 (0.99-1.26)	1.15 (1.01-1.32)	.01	.54
Restricted to myocardial infarction and coronary heart disease death						
Cases/person-years	151/1 018 680	161/1 311 173	38/229 694	35/135 197		
Incidence rate per 100 000 person-years (95% CI)[e]	14.8 (9.5-20.2)	12.4 (7.9-16.9)	16.2 (4.3-28.0)	24.4 (7.2-41.6)		
Multivariable-adjusted model, HR (95% CI)[f]	1 [Reference]	0.83 (0.66-1.04)	0.98 (0.69-1.41)	1.09 (0.75-1.59)	.71	.55
Updated shift work[g]						
Cases/person-years	589/554 846	1077/872 476	328/222 286	233/118 813		
Incidence rate per 100 000 person-years (95% CI)[e]	115.8 (91.2-140.4)	137.4 (116.2-158.6)	161.9 (116.3-207.6)	190.5 (125.1-255.8)		
Age-adjusted model, HR (95% CI)	1 [Reference]	1.18 (1.06-1.30)	1.40 (1.22-1.61)	1.59 (1.36-1.85)	<.001	
Multivariable-adjusted model, HR (95% CI)[f]	1 [Reference]	1.12 (1.01-1.24)	1.19 (1.04-1.37)	1.27 (1.09-1.48)	.001	.84

(Updated shift work refers to cumulative duration of rotating night shift work reported up to 2007)

8.研究結果有多精準?

- 如果有提供的話，尋找信賴區間的範圍。 是

Table 4. Shift Work and Risk of Coronary Heart Disease in Women Without Diabetes, Hypertension, or Hypercholesterolemia[a]

Cohort	Baseline History of Rotating Night Shift Work[b] None	<5 y	5-9 y	≥10 y	*P* Value for Trend[c]	*P* Value for Interaction, Shift Work × Time[d]
NHS, 1988-2012						
Cases/person-years	723/319 135	791/316 198	157/47 860	260/75 528		
Incidence rate per 100 000 person-years (95% CI)[e]	301.4 (243.5-359.2)	323.7 (263.0-384.4)	409.4 (238.3-580.5)	380.0 (255.1-504.9)		
Age-adjusted model, HR (95% CI)	1 [Reference]	1.06 (0.96-1.18)	1.37 (1.15-1.63)	1.36 (1.17-1.57)	<.001	
Multivariable-adjusted model, HR (95% CI)[f]	1 [Reference]	1.08 (0.97-1.19)	1.29 (1.08-1.54)	1.17 (1.01-1.36)	.004	.24
NHS2, 1989-2013						
Cases/person-years	720/748 075	1001/966 924	193/165 593	134/92 148		
Incidence rate per 100 000 person-years (95% CI)[e]	100.6 (81.1-120.2)	112.1 (93.6-130.7)	122.9 (74.3-171.5)	136.8 (78.8-194.9)		
Age-adjusted model, HR (95% CI)	1 [Reference]	1.09 (0.99-1.20)	1.17 (1.00 -1.38)	1.28 (1.06-1.54)	.003	
Multivariable-adjusted model, HR (95% CI)[f]	1 [Reference]	1.09 (0.99-1.20)	1.10 (0.94 -1.30)	1.13 (0.94 -1.36)	.11	.78

9.你相信這個研究結果嗎?

是

- 大的效果往往難以忽視！但：這是否可能是由於偏差、巧合或干擾因素造成的嗎?
- 是否研究設計和方法的缺陷足以造成不可信結果?
- 布拉德福德希爾準則(Bradford Hills criteria)(如：時間序列、劑量 - 效應關係、生物學合理性、一致性)

C.研究結果對於當地病人有幫助嗎?

- 10.研究結果是否可以應用在本地族群?
- 世代研究是回答此問題適當的方法 。是

- 研究中所涵蓋的受試者可能因為與你所關注的族群有明顯差異而足以引起關注嗎?與本國夜班定義可能不同

- 你當地的環境背景與研究的環境背景明顯不同嗎? 否

- 你可以量化本地的利益和危害嗎? 是

是

11.這個研究結果與其他現有的證據相符合?

- In 1995, Kawachi *et al* examined the association between rotating night shiftwork and CHD in the Nurses' Health Study (NHS) over 4 years of follow-up and reported a 51% significant increase in CHD risk (nonfatal MI and CHD death) among women with more than 6 years of rotating night shift work after multivariable adjustment (incidence rate per 100,000 person-years, 156.1 compared with 75.4 among women who never worked night shifts).

- A systematic meta-analysis reported a 24% elevated CHD risk associated with most types of shift work but noted significant heterogeneity in exposure assessment and study designs across studies.

是

討論重點摘要

- **醫師:**
  - BMI≧30，且輪值夜班≧10年者，其發生冠心病之風險愈大
- **職安室:**
  - 護理人員上夜班易有飲食不正常、及飲食量增加而增加體重(心血管疾病危險因子)
  - 本院辦理各項健康促進活動運動，鼓勵同仁參加
- **護理:**
  - 相較年齡小的組別，年齡較大者發生冠心病比率增加，婦女停經後荷爾蒙改變，本來就會增加心血管疾病風險
  - 本文尚有其他變數，如:輪值夜班時數、上班工時、兩組工作負荷量、身體活動度、疾病診斷均採用問卷資料
  - 可提升護理人員上夜班時的睡眠品質與時數，並鼓勵多運動，多運用運動中心的資源，以預防冠心病發生

臨床運用

- 護理工作無法避免輪班，但針對資深護理同仁輪值夜班時，建議積極注意心血管疾病的預防，如生活型態、飲食、運動等方式

同意 25票

懷疑 0票

不同意 0票


Thank
You!