

RESEARCH

CHRISTMAS 2013: RESEARCH

The Brady Bunch? New evidence for nominative determinism in patients' health: retrospective, population based cohort study

 OPEN ACCESS

John J Keaney *cardiology specialist registrar*¹, John D Groarke *cardiology specialist registrar*¹, Zita Galvin *gastroenterology specialist registrar*², Catherine McCorrigan *consultant cardiologist*¹, Hugh A McCann *consultant cardiologist*¹, Declan Sugrue *consultant cardiologist*¹, Edward Keelan *consultant cardiologist*^{1,3}, Joseph Galvin *consultant cardiologist*^{1,3}, Gavin Blake *consultant cardiologist*¹, Niall G Mahon *consultant cardiologist*¹, James O'Neill *associate professor*^{1,3,4}

¹Cardiology Department, Mater Misericordiae University Hospital, Dublin 7, Ireland; ²Liver Centre, Mater Misericordiae University Hospital, Ireland; ³James Connolly Memorial Hospital, Blanchardstown, Dublin, Ireland; ⁴Royal College of Surgeons in Ireland, Dublin, Ireland

Abstract

Objective To ascertain whether a name can influence a person's health, by assessing whether people with the surname "Brady" have an increased prevalence of bradycardia.

Design Retrospective, population based cohort study.

Setting One university teaching hospital in Dublin, Ireland.

Participants People with the surname "Brady" in Dublin, determined through use of an online telephone directory.

Main outcome measure Prevalence of participants who had pacemakers inserted for bradycardia between 1 January 2007 and 28 February 2013.

Results 579 (0.36%) of 161 967 people who were listed on the Dublin telephone listings had the surname "Brady." The proportion of pacemaker recipients was significantly higher among Bradys (n=8, 1.38%) than among non-Bradys (n=991, 0.61%; P=0.03). The unadjusted odds ratio (95% confidence interval) for pacemaker implantation among individuals with the surname Brady compared with individuals with other surnames was 2.27 (1.13 to 4.57).

Conclusions Patients named Brady are at increased risk of needing pacemaker implantation compared with the general population. This finding shows a potential role for nominative determinism in health.

Weedon and Splatt's paper¹ on the urethral syndrome in the *British Journal of Urology* is often cited not only for its obvious scientific merit, but also as a great example of nominative determinism. The term nominative determinism describes how certain people seem compelled towards a particular profession because of the influence of their surname. It was first coined by

New Scientist journalist John Hoyland in 1994.² This is not to suggest that the theory is a recent one. Over 40 years before Hoyland, in 1952, Swiss analytical psychologist Carl Jung had noted "the sometimes quite gross coincidence between a man's name and his peculiarities or profession."³

We rarely need to search for too long for great examples—Marie Harte was a cardiologist in Dublin for many years—but the growth of the internet has increased the ease with which we can now find cases of nominative determinism (table 1↓).⁴⁻¹⁷ A newspaper article on the subject identified a dermatologist called Rash, a rheumatologist named Knee, and a psychiatrist named Couch, through use of the American Directory of Physicians.¹⁸

Obviously, science does not have a monopoly on nominative determinism. Was it a surprise that during the London 2012 Olympics, a man who shares his name with lightning became the fastest man in the world? Usain Bolt ran the 100 metre final in 9.63 seconds, faster than anyone else in history. It is also somewhat predictable that Bulgarian hurdler Vania Stambolova would, well, stumble over as she did, unfortunately falling at the first hurdle in her heat. On a more sombre note, Will Drop was a Montreal window cleaner who died in a fall, and on the same day in October 1941, two inmates of the Florida state prison, Willburn and Frizzel, were sent to the electric chair.

Of course, the above examples could be pure chance, devoid of any scientific basis; but there are some supportive claims within the field of psychology. Pelham and colleagues concluded in a paper that people have a preference for things "that are

connected to the self,¹⁹ and are disproportionately more likely to find careers with a label closely related to their name. Indeed, psychologists have shown that as well as influencing your own personal actions, a name also affects how others treat us. This effect may range from preferential grading of a student with a more pleasant name by their teacher²⁰ to more favourable findings by jurors.²¹

We sought to determine whether a person's name could influence their health. To investigate our theory we used the example surname "Brady," and sought to establish whether people with that name in Dublin had an increased incidence of bradycardia.

Methods

The percentage of the population in Dublin, Ireland, with the surname Brady was determined through use of online residential telephone listings.²² The prevalence of bradyarrhythmia in the general population is unknown. Sinus bradycardia, particularly in young people, can be entirely asymptomatic, but symptomatic bradycardia is a class IB indication for permanent pacemaker insertion.²³ Therefore, we used pacemaker insertion as a marker of bradycardia. We used the pacemaker database at a university teaching hospital in Dublin to calculate the proportion of pacemakers implanted in patients named Brady in our institution over 61 months (from 1 January 2007 to 28 February 2013).

We presented categorical data as percentages and continuous, non-normally distributed data as medians with interquartile ranges. We compared baseline characteristics by surname (Brady v other surnames) using Fisher's exact test for binary variables and Wilcoxon rank sum test for non-normally distributed continuous variables. The relation between the likelihood of pacemaker implantation and the name Brady was presented as a crude odds ratio with associated 95% confidence intervals. A confidence interval for this measure of effect that did not contain the null value of 1 was considered as evidence of a significant association between the surname Brady and pacemaker implantation. We did all analyses using SAS version 9.3. A two tailed value of $P < 0.05$ was considered statistically significant.

Results

Of 161 967 residential telephone listings in the Dublin area, 579 (0.36%) Bradys were listed. During the study, 1012 pacemakers were implanted in the teaching hospital in Dublin; 13 patients with names other than Brady were excluded from analyses owing to missing data. Of 999 pacemaker recipients remaining, 557 (55.8%) were male with a median age of 77 years (interquartile range 70-83). Eight (0.8%) of the devices were implanted in patients named Brady. Among pacemaker recipients with Brady as a surname ($n=8$, 0.8%) and those with other surnames ($n=991$, 99.2%), age did not differ significantly (table 2⇓). However, there was a non-significant tendency for Brady recipients to be male ($n=7$, 87.5%) compared with recipients with other names ($n=550$, 55.5%; $P=0.08$).

Using residential telephone listings as a crude indicator of overall proportions of Bradys and non-Bradys within the catchment area of the study centre, the proportion of pacemaker recipients among Bradys (eight (1.38%) of 579) was significantly higher than among non-Bradys (991 (0.61%) of 161 388; $P=0.03$, using Fisher's exact test). The unadjusted odds ratio for pacemaker implantation among individuals with the surname Brady compared with other surnames was 2.27 (95% confidence interval 1.13 to 4.57).

Discussion

This study shows a link between people's names and their health. The underlying mechanisms through which people with the name Brady have a higher incidence of bradycardia than the general public are at present unclear. Genetic mutations causing familial sinus bradycardia have been described, particularly affecting the HCN4 cardiac ion channel,²⁴⁻²⁶ and a familial genetic predisposition could explain the increased rates of pacemaker insertion in our Brady cohort.

The high percentage of male patients in the Brady pacemaker group was also noteworthy, although not statistically significant. It suggests that the effect of the name Brady on your conduction system is likely only to be seen in people born as Brady rather than those who become Brady when they get married. Indeed, the number of true Bradys with pacemakers may have been underestimated, because female patients with pacemakers whose maiden name was Brady were not determined in this study.

This increased bradyphenomenon in Bradys could be attributable to increased levels of bradykinin. Some animal studies have shown bradykinin to reduce heart rate.²⁷⁻²⁹ Bradykinin seems to elicit this bradycardiac effect by centrally controlling the baroreflex heart rate.³⁰ However, these studies have been contradicted in other animal studies,³¹⁻³⁴ and have not been replicated in humans.

Limitations

This single centre, retrospective analysis had several limitations. We did not have information on whether the patients were related; therefore, genetic predisposition in one single family could have biased the data. However, four male Bradys have the same first name, which makes it more unlikely that these particular patients, at least, were first degree relatives.

Geographical biases could have influenced the results. There are eight hospitals in the greater Dublin area in which pacemakers are implanted. If there is a greater proportion of Bradys in our catchment area compared with the rest of the city, the implantation rates for Bradys in our institution would be artificially elevated. However, we found no evidence that such a cluster of Bradys exists in north central Dublin.

Social biases include use of landline telephones and private health insurance by Bradys. If Bradys are less likely to attend private hospitals, implantation rates in our university hospital—which is a public hospital—would be artificially high. The use of landline telephones in Ireland has fallen substantially over recent years. If technology savvy Bradys have abandoned the traditional landline in favour of mobiles more frequently than non-Bradys, this difference could lead to a telephone bias.

Conclusion

We have shown that the influence of a person's name not only affects their professional career or how others may treat them, but can also extend to determining aspects of their health. Further research could include investigating increased rates of obesity in the Fatt family or depression in people whose surname is Lowe. We believe that this finding could have an important role in public health medicine, and screening programmes that are name specific could be developed for families at risk.

Contributors: JJK extracted the data from the pacemaker database and wrote the main body of the article and is the study guarantor. JDG did the statistical analysis and contributed to the methods section. ZG constructed table 1. CMcG aided with design of methods and planning of statistical analysis. HAMcC, DS, GB, JG, EK, and NGM all developed

and maintained the original database which was the source of our patient information. JO'N developed the initial hypothesis and was research supervisor.

Funding: There was no specific funding for this study.

Competing interests: All authors have completed the ICMJE uniform disclosure form at www.icmje.org/coi_disclosure.pdf and declare: no support from any organisation for the submitted work; Actelion Pharmaceuticals awarded JJK a Newman fellowship in translational medicine and pulmonary hypertension in July 2011, for two years (€35 000 per year), which was used to fund his salary while working as a full time research registrar in the Mater Hospital and while working towards an MD; Actelion Pharmaceuticals did not have any influence over the topic of JJK's research; no other relationships or activities that could appear to have influenced the submitted work.

Ethical approval: Ethical approval was given by the hospital ethics committee.

Data sharing: No additional data available.

The lead author (the manuscript's guarantor) affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

- Splatt AJ, Weedon D. The urethral syndrome: morphological studies. *Br J Urol* 1981;53:263-5.
- Hoyland J. Feedback. *New Scientist* 1994 Nov 5.
- Jung CG. Synchronicity: an acausal connecting principle. 1973. 2nd ed. Princeton University Press, 1952.
- Fear NT, Seddon R, Jones N, Greenberg N, Wessely S. Does anonymity increase the reporting of mental health symptoms? *BMC Public Health* 2012;12:797.
- Ache JM, Matheson T. Passive resting state and history of antagonist muscle activity shape active extensions in an insect limb. *J Neurophysiol* 2012;107:2756-68.
- Loiseau C, Harrigan RJ, Cornel AJ, Guers SL, Dodge M, Marzec T, et al. First evidence and predictions of Plasmodium transmission in Alaskan bird populations. *PLoS ONE* 7:e44729.
- Snowman D. Pole positions: the polar regions and the future of the planet. 1st ed. Teach Yourself Books, 1993.
- Fountain AG, Walder JS. Waterflow through temperate glaciers. *Rev Geophys* 1998;36:299-328.
- Spray CJ. Assessing the recreation value of freshwaters: the UK experience. Stationery Office, 1997.
- Papapoulos S, Chapurlat R, Libanati C, Brandi ML, Brown JP, Czerwiński E, et al. Five years of denosumab exposure in women with postmenopausal osteoporosis: results from the first two years of the FREEDOM extension. *J Bone Miner Res* 2012;27:694-701.
- Davis NF, Smyth LG, Giri SK, Flood HD. Evaluation of endoscopic laser excision of polypropylene mesh/sutures following anti-incontinence procedures. *J Urol* 2012;188:1828-32.
- Harte MT, Teo KK, Horgan JH. The diagnosis and management of supraventricular tachycardia by transesophageal cardiac stimulation and recording. *Chest* 1988;93:339-44.
- Arun B, Jacob J, Byrne JP. An uncommon burn. *Br J Dermatol* 2009;160:197.

- Seymour K, Clifford CW, Logothetis NK, Bartels A. Coding and binding of color and form in visual cortex. *Cereb Cortex* 2010;20:1946-54.
- El-Mallakh RS, Linder M, Valdes R, Looney S. Dialysis of saliva improves accuracy of saliva lithium determinations. *Bipolar Disord* 2004;6:87-9.
- Sun K, Zhao B, Murugesan V, Kumar A, Zeng K, Subbiah J, et al. High-performance polymer solar cells with a conjugated zwitterion by solution processing or thermal deposition as the electron-collection interlayer. *J Mater Chem* 2012;22:24155-65.
- Potts JM, Payne CK. Urologic chronic pelvic pain. *Pain* 2012;153:755-8.
- Highfield R. The name game—the weird science of nominative determinism. *London Evening Standard* 2011 March 24.
- Pelham B, Mirenberg MC, Jones JT. Why Susie sells seashells by the seashore: Implicit egotism and major life decisions. *J Person Soc Psychol* 2002;82:469-87.
- Harari H, McDavid JW. Name stereotypes and teachers' expectations. *J Educ Psychol* 1973;65:222-5.
- Luscri G, Mohr PB. Surname effects in judgments of mock jurors. *Psychol Rep* 1998;82:1023-6.
- Eircom. About Eircom. www.eircomphonebook.ie.
- Brignole M, Auricchio A, Baron-Esquivias G, Bordachar P, Boriani G, Briethardt O, et al. 2013 ESC guidelines on cardiac pacing and cardiac resynchronization therapy. The task force on cardiac pacing and resynchronization therapy of the European Society of Cardiology (ESC). Developed in collaboration with the European Heart Rhythm Association. *Eur Heart J* 2013;34:2281-329.
- Laish-Farkash A, Brass D, Marek-Yagel D, Pras E, Dascal N, Antzelevitch C, et al. A novel mutation in the HCN4 gene causes symptomatic sinus bradycardia in Moroccan Jews. *J Cardiovasc Electrophysiol* 2010;21:1365-72.
- Ueda K, Nakamura K, Hayashi T, Inagaki N, Takahashi M, et al. Functional characterization of a trafficking defective HCN4, D553N, associated with cardiac arrhythmia. *J Biol Chem* 2004;279:27194-8.
- Nof E, Luria D, Brass D, Marek D, Lahat H, Reznik-Wolf H, et al. Point mutation in the HCN4 cardiac ion channel pore affecting synthesis, trafficking, and functional expression is associated with familial asymptomatic sinus bradycardia. *Circulation* 2007;116:463-70.
- Caligiore SM, Santos RA, Campagnole-Santos MJ. Cardiovascular effects produced by bradykinin microinjection into the nucleus tractus solitarius of anesthetized rats. *Brain Res* 1996;720:183-90.
- Ribout C, Godin D, Couture R, Regoli D, Nadeau R. In vivo B2-receptor-mediated negative chronotropic effect of bradykinin in canine sinus node. *Am J Physiol* 1993;265:H876-90.
- Izraityan I, Kresh JY. Bradykinin modulation of isolated rabbit heart function is mediated by intrinsic cardiac neurons. *Cardiovasc Res* 1997;33:641-9.
- Bomtempo CA, Santos GF, Santos RA, Campagnole-Santos MJ. Interaction of bradykinin and angiotensin-(1-7) in the central modulation of the baroreflex control of the heart rate. *J Hypertens* 1998;16:1797-804.
- Loro JF, Zhang J, Pfannendorf M, van Zweiten PA. Positive chronotropic activity of bradykinin in the pithed normotensive rat. *Fundam Clin Pharmacol* 1998;12:77-81.
- Nakano J. Effects of synthetic bradykinin on the cardiovascular system. *Arch Int Pharmacodyn Ther* 1965;157:1-13.
- Nakashima A, Angus JA, Johnston CI. Chronotropic effects of angiotensin I, angiotensin 11, bradykinin and vasopressin in guinea pig atria. *Eur J Pharmacol* 1982;81:479-85.
- Staszewka-Barczak J, Ferreira SH, Vane JR. An excitatory nociceptive cardiac reflex by bradykinin and potentiated by prostaglandins and myocardial ischemia. *Cardiovasc Res* 1976;10:314-27.

Accepted: 15 October 2013

Cite this as: *BMJ* 2013;347:f6627

This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 3.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/3.0/>.

Tables

Table 1 | Examples of nominative determinism in scientific publications

Publication author surname	Subject
Fear ⁴	Mental health symptoms
Ache ⁵	Muscle activity
Sehgal ⁶	Alaskan birds
Snowman ⁷	The polar regions
Fountain ⁸	Water flow
Spray ⁹	Fresh water
Bone ¹⁰	Osteoporosis
Flood ¹¹	Incontinence
Harte ¹²	Cardiac arrhythmias
Byrne ¹³	Burns
Seymour ¹⁴	Visual cortex
Looney ¹⁵	Bipolar disorder
Sun ¹⁶	Solar cells
Payne ¹⁷	Pelvic pain

Table 2| Baseline demographics of pacemaker recipients

	Pacemaker recipients			P*
	All (n=999)	With Brady surname (n=8, 0.8%)	With other surname (n=991, 99.2%)	
Age (median, interquartile range)	77 (70-83) years	78 (71-81) years	77 (70-83) years	0.78†
Male sex (No, %)	557 (56)	7 (88)	550 (56)	0.08‡

*Comparison between Brady and non-Brady cohorts.

†Wilcoxon rank sum test.

‡Fisher's exact test.