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<http://www.afibbers.org>

VIRTUAL LAF CONFERENCE

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SUBJECT: *Seasonal Variation in Afib Frequency*

Several afibbers have reported that they have more frequent episodes during different times of the year and under different weather conditions. Two studies now support the notion of a connection between season/weather and afib frequency.

TOYOAKE, JAPAN. It is well established that the incidence of several cardiovascular diseases peaks during the winter. Japanese researchers now report that the incidence of paroxysmal (intermittent) atrial fibrillation (PAF) also exhibits a seasonal pattern. Their 5-year study involved 12,390 patients with an average age of 65 years (range of 16 to 95 years) for whom 24-hour Holter recordings were available. Analysis of the recordings revealed the presence of 258 paroxysmal afib episodes in 237 patients, or an overall incidence of 2.1%. The researchers observed a distinct peak in episode incidence during the month of September (3% of recordings during the month) and a distinct minimum during the month of June (1.2% of recordings). Thus the incidence of PAF was 62% lower in June than in September. The peak month for PAF was found to be different for the 152 patients aged 65 years or older (18% lone afibbers) and the 85 patients younger than 65 years (47% lone afibbers).

In the younger group the peak month was December and the minimum month was June with an incidence difference of 63%. In the older group the peak month was September and the minimum month was June with an incidence difference of 62%. The Japanese researchers also made the following interesting observations:

- The cumulative episode duration in older afibbers was substantially longer than among younger ones (377 minutes vs 244 minutes).
- Only 39% of recorded episodes were accompanied by symptoms such as palpitations and shortness of breath indicating that most recorded episodes were asymptomatic.
- The incidence of PAF also showed an autumn peak and a summer minimum.
- Treatment with antiarrhythmic drugs did not influence the seasonal pattern of PAF.
- There was no significant interaction between outdoor temperature and PAF incidence, but longer daylight periods were associated with a lower incidence of PAF.

The researchers speculate that sharp variations in daily temperatures and atmospheric pressure commonly occurring during autumn may explain the PAF peak during this season. They also suggest, based on animal experiments, that fewer daylight hours may increase gene expression of certain potassium-related ion channels resulting in a shorter action potential duration and thus a greater risk of initiating an afib episode.

Watanabe, E, et al. Seasonal variation in paroxysmal atrial fibrillation documented by 24-hour Holter electrocardiogram. *Heart Rhythm*, Vol. 4, January 2007, pp. 27-31

Editor's comment: In addition to the above speculations, the study could also point to a connection between PAF episode frequency and vitamin D and/or melatonin. Subsequent to the publication of the Heart Rhythm article, Polish researchers reported an association between PAF frequency and weather conditions. A summary of their work is presented below. Their speculation about the effect of electromagnetic radiation (EMF) upon afib frequency seems to me to be of particular relevance considering the "soup" of EMF in which we are all immersed today.

LUBLIN, POLAND. It has been known since the time of Hippocrates that the weather (atmospheric conditions) influences people's mood and health. As far back as the first half of the 19th century, Polish researchers reported an association between short-term weather changes and a worsening of angina, increased incidence of heart attacks, and more pronounced fluctuations in blood pressure. More recent research has shown that levels of the stress hormone cortisol are lower at high barometric pressures and that lower levels are associated with a lessening of depression. So, conceivably, a person with elevated cortisol levels would feel better on a sunny day.

Polish researchers report that weather conditions also affect the incidence of paroxysmal afib episodes. Their study involved 739 patients (52% females, average age of 65 years, range of 18-91 years) who were admitted to hospital because of an AF episode during the period 2005-2006. Patients with acute coronary syndrome, myocarditis, pericarditis, thyrotoxicosis, and respiratory problems were excluded from the study, as were those who had recently suffered a heart attack.

The researchers correlated the number of patients admitted each day with air temperature, atmospheric pressure, wind speed and cloudiness, and also investigated the effect of approaching cold fronts and warm fronts. On average, there was one admission per day related to afib episodes. However, there were 9 days on which 4 patients were admitted and 4 days on which 5 patients were admitted. There was a seasonal effect with more cases (2.4/day) reported in the winter (December to February) than in the spring and summer (1.7 cases/day during the period May to August).

The most interesting correlation though was between the approach of a cold front and the number of afib-related hospital admissions. All the high admission days (4-5 cases/day) occurred 24-36 hours prior to the arrival of a cold front. The researchers speculate that the effect may be due to the electromagnetic waves created in deep low-pressure systems and storm centers. These waves travel at the speed of light, whereas the front itself moves at 10-50 km/hr, thus explaining why the effect of an approaching cold front would be felt 24-36 hours in advance. The researchers found no relationship between afib incidence and the approach of a warm front. However, they did notice that periods of constant high atmospheric pressure were associated with a significant decline in hospital admissions for AF. Gluszek, A, et al. Episodes of atrial fibrillation and meteorological conditions. *Kardiologia Polska*, Vol. 66, September 2008, pp. 958-63

Editor's comment: The speculation that a temporary increase in exposure to electromagnetic radiation may precipitate afib episodes is indeed an interesting one and, if proven correct, could perhaps partly explain the current AF epidemic, which certainly coincides with a vast increase in our exposure to electromagnetic radiation. As way of explanation the Polish researchers make the following remarks:

"Electromagnetic waves penetrate into the tissue to a depth depending on the electric resistance and wavelength. In the very low frequency generated by atmospheric conditions (up to 10 MHz) living tissue acts as a conductor in which an alternating electric field produces Foucault eddy currents practically induced in the entire body. These phenomena were also reported by Kozlowski, who claimed that electromagnetic field effects in the body tissues involve stimulation of particles and atomic movements which cause chemical reactions and bioelectric processes. Induction of these changes occurs in electromagnetic field of relatively low intensities. This was also underlined by Hessmann-Kosaris, who reported that even weak electromagnetic fields may affect metabolic processes of cells and cellular membranes".

This seems like a worthy discussion topic so please join in with your observations and speculations!

Hans

I totally agree with this theory and finding. I'm a living testament to this phenomenon. September to March: afib. April to August: 90% NSR.
There is a connection.

Chris

I've banged on about this now and again here on this forum for some time. I've had 10 episodes (all vagal i.e. 2 times late evening and 8 times 3-7am) in 10 years, ALL of which were October to March except for one which was in May (2002) BUT was one that occurred at 11-30pm whilst in a VERY hot bath after having eaten a MASSIVE lamb tagine meal at 9pm washed down with the best part of a bottle of single malt (50:50 with coca-cola - sacrilege!!) thereafter.....

October/November seems to be the riskiest time for me.

Mike F.

Interesting study. The weather correlation seems plausible but I would like to understand why there would be a different peak for those younger and older than 65. A statistical artifact perhaps?

After some thought, I have doubts about the connection between natural EF fields caused by storms and heart rhythm. If there is a connection, then a study of electric utility workers should show correlation with AF or other arrhythmia prevalence. For some background, see below.

<http://www.niehs.nih.gov/health/docs/emf-02.pdf>

researcher

Thank you for that very interesting and comprehensive article. It may well be that the effects of exposure to 60 Hz fields is relatively benign. However, to extrapolate these findings to fields of 10,000,000 Hz would as Spock no doubt would have said be "illogical". Also, there are actually several reports of detrimental effects of these high-frequency fields and even of peak exposures to 60 Hz fields. Here are some examples:

<http://www.yourhealthbase.com/database/a110c.htm>

<http://www.yourhealthbase.com/database/a122i.htm>

<http://www.yourhealthbase.com/database/n107i.htm>

Hans

I have noticed in the last few years that I am afib free from May to October, towards the end of Oct. of last year I had an episode of afib after about 6 months without an episode. In November more afib, also Dec. and a couple in Jan. of this year, my episodes start to taper off beginning now, the days are beginning to get longer.

What I believe is happening, it is when the days are starting to get longer my afib recedes, when the days are getting shorter, my afib starts up, so it is the light. I don't believe as the article states that it is the cold weather, as I have been in Florida in the winter and have gotten afib.

I am going to get a Full Spectrum High Definition Light; Lux light therapy. One is to sit before the spectrum for about 20 min/day, I will try that and see if it helps next winter. If nothing else, it is supposed to help ones' mood.

Liz

I have had an ongoing problem with ectopic beats for over thirty years. I have been hospitalized four times for heart "problem," during this time frame. Three of those times the doctors could not tell me what was wrong, other than an irregular heartbeat. Once tachycardia, once panic attack-Vietnam syndrome and once dysarrhythmia. The last time was for afib, which lasted ten days. I self converted on my own and went into aflutter two months later during a stress test. I returned to NSR two hours later on my own.

Interestingly, all of these episodes happened between Nov and Jan.

Robin

I would like to see more research on vit D levels and afib. Since vit D is associated with the bodies ability to absorb minerals I think this could influence frequency of afib. It would also explain the reduction of afib in the months with longer days and more sunlight.

Debbie

I always read with interest the season or weather-related afib histories of our posters. Most afib experience seems to fit the above findings.

Just to be totally ornery, my experience is totally opposite the general findings. Since I started keeping track in 2003, I have found my bad afib months (with the most episodes) to be June - September, with July or August the worst. Just to skew the findings even more, I should mention that I am in the over-65 group.

Pretty well all my adult life I have disliked heat. Anything over 72 F gets uncomfortable and makes me sweat a lot. I love cold, rainy weather & am not especially fond of bright sunshine either. Old people are supposed to crave heat, but I certainly do not - go figure!

I don't know if there is any relationship between my discomfort with heat and increased a-fib, or why there might be one in the first place. Since I have a tendency to sweat a lot in warmth, it may be a deficiency of electrolytes. It certainly is not dehydration, since in warm weather I increase my water intake. As I increase the liquids, I also increase potassium & magnesium intake, so that should not be the problem either.

This summer it will be interesting to see if things have improved after my second ablation in October '09. Jan - March are usually fairly a-fib free, so I can't tell yet if the ablation has lessened the frequency of episodes. So far I have had several episodes, but not nearly as many as last year after ablation # 1.

Cheers,

Reet

My pattern of afib is again paralleling the previous year. Afib in Nov., Dec., tapering off in Jan., and no afib for the month of Feb. Since it is still cold, it has to be the lengthening days of light.

Maybe for me, I have found a cause---next winter I will use the lux lights and see if that will help.

Seems like very few posters are affected by the short days of light. Another thing is that I go to bed late and get up later than most so I get less daylight to begin with.

Liz

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