



Shining Some Light On Seasonal Affective Disorder

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Overview

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Introduction



MEDICAL ALERT

SHARELL MADDEN
BALTIMORE RESIDENT



What is SAD?

- Subtype of Major Depressive Disorder related to changes in seasons
- Typically occurs at the same time of the year
- Occurs due to disruption of body's internal biological clock
- Related to changes in Serotonin and Melatonin levels in the body

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Signs & Symptoms

Symptoms of SAD

CLASSIC SYMPTOMS



Oversleeping



Daytime fatigue



Carbohydrate craving



Weight gain

OTHER SYMPTOMS



Decreased sexual desire



Lethargy



Hopelessness



Suicidal thoughts



Lack of interest in normal activities and social interactions

Nearly 10 hours of sleep during winter

Greater tendency for nodding off at work and less energy

Strong craving for carbs causes rise in tryptophan levels

Biological response to a seasonal drop in serotonin

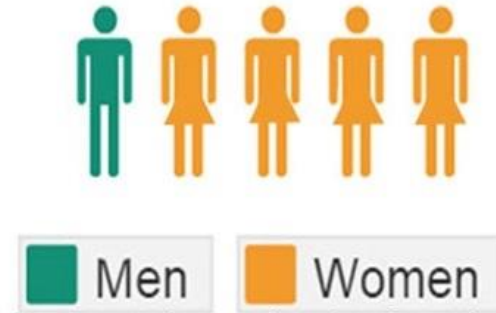
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Epidemiology & Risk Factors

Epidemiology

- Community based studies estimate SAD prevalence to be around 10 % in northern latitudes
- Following DSM-IV–TR criteria SAD prevalence is:
 - 1-2% in the United States
 - Around 2% in Canada
- Higher incidence among women, especially during childbearing years
 - female-to-male ratio of 4:1

Ratio of Men to Women in US with SAD





*Areas affected
by SAD*

*Areas affected
by SAD*

Risk Factors

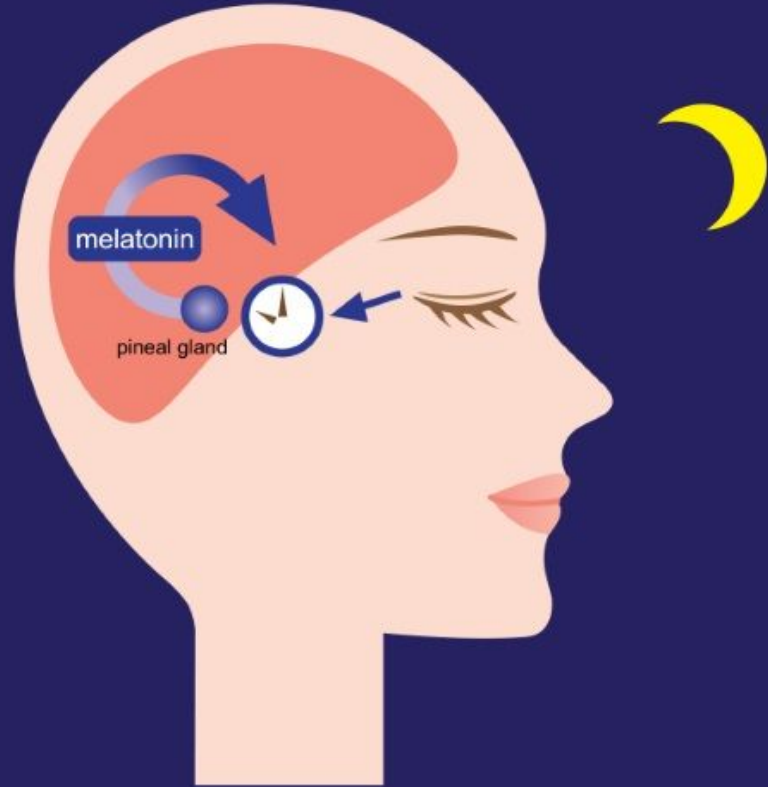
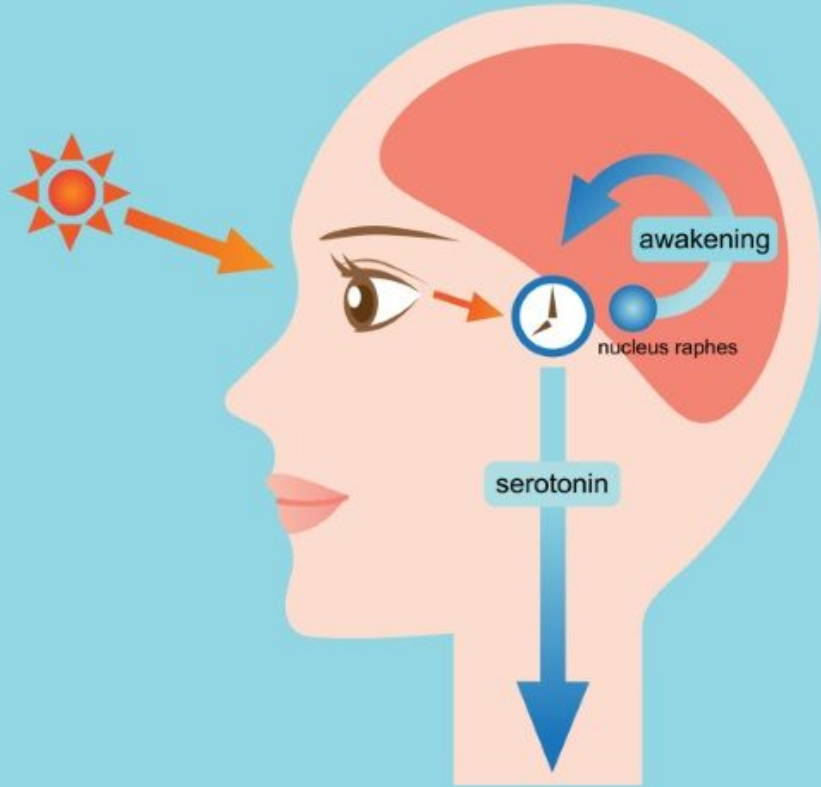


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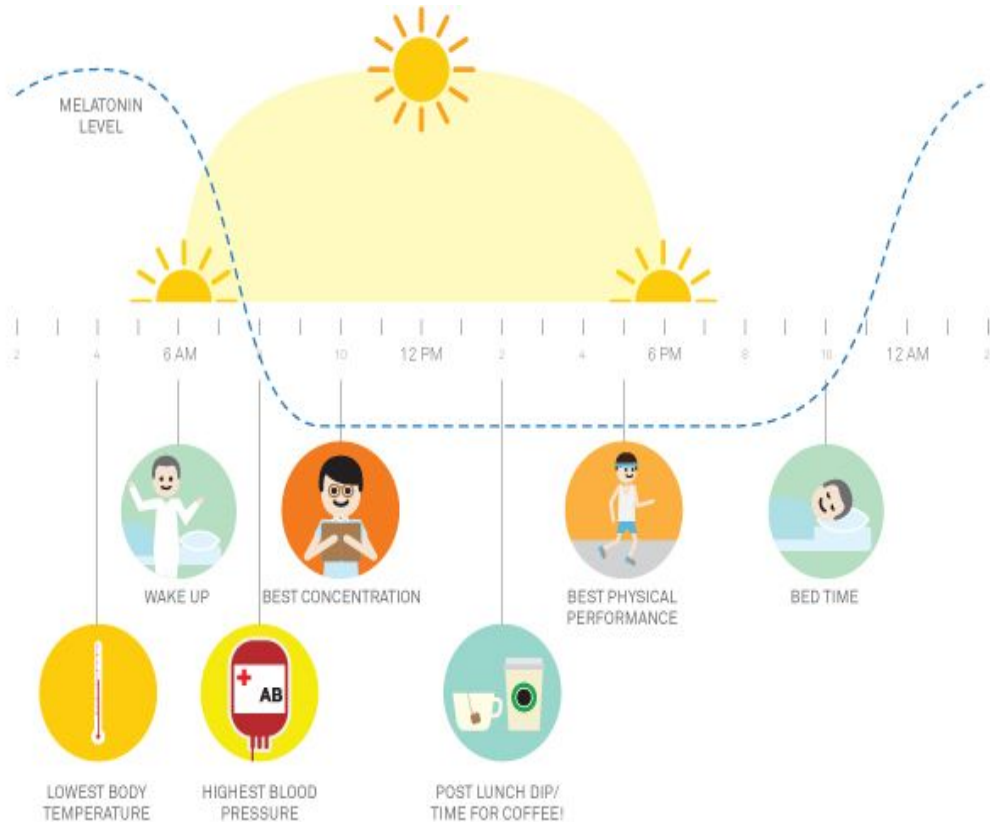
Pathophysiology

The body clock

Circadian Rhythms



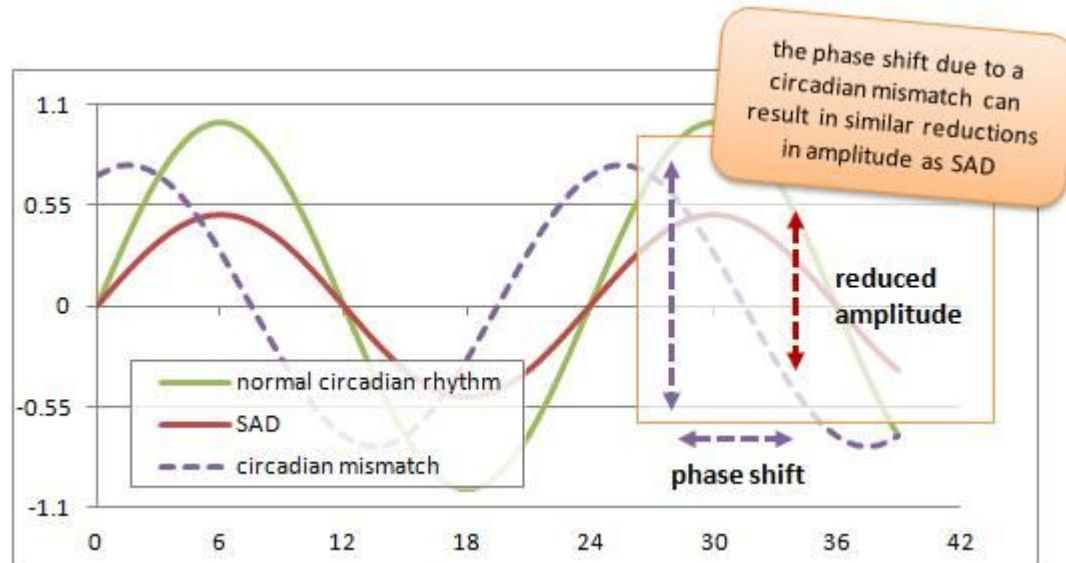
Photoperiod and Melatonin



Melatonin

- Light suppresses melatonin secretion
- Melatonin secretion abnormal in SAD patients
- Undetermined causal process

Circadian Phase Shift



- Mismatch in circadian rhythm due to external factors
- Shift in natural and social clocks of individuals
- Shortened time length of overall circadian cycle

Neurotransmitters

Serotonin (5-HT)

- Fluctuate with seasons
- Lowest in winter months
- Low baseline level in SAD patients

Norepinephrine

- Depressive SAD symptoms
- Hypersomnia and increased eating
- Low baseline level in SAD patients

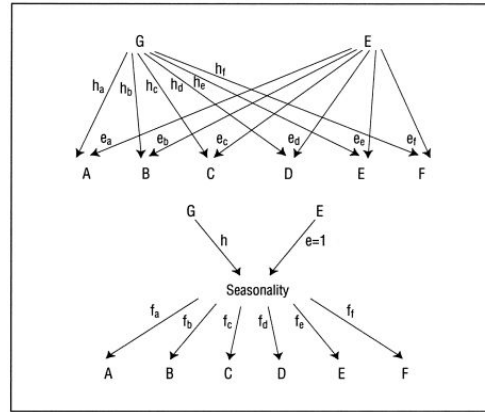
Dopamine

- Low functional activity in SAD patients
- Levels stable year round
- Decreased eye-blink rates



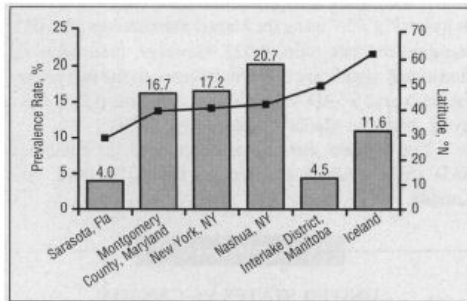
Genetics

Genetic Basis of SAD rates



Modified from (Madden et al., 1996)

Genetic Basis of Sex Factors



Combined prevalence rates of seasonal affective disorder and subsyndromal seasonal affective disorder at different latitudes (line with squares) in three locations in the United States, Iceland, and among people of wholly Icelandic descent in Canada. (Magnusson & Axelsson, 1993)

Genetic Basis with Twin Study

Table 2
Within-pair polychoric correlations of the SPAQ for each zygosity group

	MZ-M	DZ-M	MZ-F	DZ-F	DZ-O
Sleep	0.42	0.32	0.32	0.27	-0.15
Social	0.36	0.20	0.33	0.06	0.02
Mood	0.53	0.26	0.33	0.27	-0.22
Weight	0.30	0.32	0.35	0.47	-0.04
Appetite	0.72	-0.15	0.46	0.11	-0.18
Energy	0.65	0.03	0.29	0.26	0.02
GSS ¹	0.69	0.12	0.45	0.26	-0.17

¹Because the GSS is a semi-continuous variable, Pearson's r is given for this variable. (Jang et al., 1997)

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Diagnosis

Diagnosis

- The first ever diagnosis criteria in the DSM was made by Rosenthal et al.
- No unique criteria in the DSM-IV
 - SAD is known as a specifier of recurrent major depressive episodes
- Important to determine the time of onset and offset of depressive episodes / rule out any other conditions



Criteria for Seasonal Pattern Specifier

- **(A)** Regular temporal relationship between the onset of major depressive episodes and a particular time of the year
- **(B)** Full remissions (or a change from depression to mania or hypomania) also occur at a characteristic time of the year
- **(C)** Two major depressive episodes meeting criteria (A) and (B) in last two years and no non-seasonal episodes in the same period
- **(D)** Seasonal major depressive episodes substantially outnumber the nonseasonal episodes

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Treatments

Phototherapy

- Bright light therapy in the winter
- Exposure to natural or artificial light suppresses brain's secretion of melatonin
- 2500 lx of artificial light in the morning
- High intensity visible light emitted through light boxes
- Patients generally show response to treatment within the first week but exposure maintained for duration of winter
- Side effects: eyestrain, headache



(Partonen, 1998)
(Terman et al., 1989)

Drug Therapies

- Antidepressants (serotonin-reuptake inhibitors)
 - Sertraline
 - Fluoxetine
 - Moclobemide



Psychotherapy - CBT

- Preliminary studies
- Talk therapy
- Change patient's automatic thoughts, dysfunctional attitudes, withdrawal and rumination
- Effective in preventing relapse



Combined Treatment

- Combine phototherapy, psychotherapy and drug therapies
- Ideal for patients who have no response to phototherapy, psychotherapy or drug therapy alone
- Risk: overarousal



Other Therapies / Prevention



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Conclusion & Future Directions

Conclusion & Future Directions

- Using Virtual Reality light therapy
 - Emulate the summer months through VR during the winter to help alleviate SAD symptoms



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Thanks!

Any questions?