SLEEP IN THE FACE OF CANCER AND DIABETES

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Objectives

- Overview of Cancer
- Overview of Diabetes
- Common Sleep Disturbances or Disorders in Patients with Cancer or Diabetes
- What we Need to Learn About the Patient’s Needs
**Conflict of interest Disclosure**

- [x] I do not have any potential conflicts of interest to disclose.
- [ ] I wish to disclose the following potential conflicts of interest:

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<th>Type of Potential Conflict</th>
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- [ ] The material presented in this presentation has no relationship to these potential conflicts.
- [ ] This presentation presents material that is related to one or more of these potential conflicts.
Cancer is a group of diseases involving abnormal cell growth with the potential to invade or spread to other parts of the body.

These contrast with benign tumors, which do not spread to other parts of the body.

Possible signs and symptoms include a lump, abnormal bleeding, prolonged cough, unexplained weight loss, and a change in bowel movements.

While these symptoms may indicate cancer, they may have other causes.

Over 100 types of cancers affect humans.
What is Cancer

When cancer begins, it usually produces no symptoms.

When symptoms do appear they often appear as the mass grows or ulcerates.

The findings that result depend on the cancer's type and location.

Few symptoms are specific.
What is Cancer

Many frequently occur in individuals who have other conditions.

Cancer is a "great imitator".

- It is common for people diagnosed with cancer to have been treated for other diseases, which were thought to be causing their symptoms.
What is Cancer

Tobacco use is the cause of about 22% of cancer deaths.

Another 10% are due to obesity, poor diet, lack of physical activity, and excessive drinking of alcohol.

Other factors include certain infections, exposure to ionizing radiation and environmental pollutants.

In the developing world nearly 20% of cancers are due to infections such as hepatitis B, hepatitis C and human infection.

These factors act, at least partly, by changing the genes of a cell.
What is Cancer

Typically many genetic changes are required before cancer develops.

Approximately 5–10% of cancers are due to inherited genetic defects from a person's parents.

Cancer can be detected by certain signs and symptoms or screening tests.

It is then typically further investigated by medical imaging and confirmed by biopsy.
What is Cancer

Many cancers can be prevented by:

- Not smoking
- Maintaining a healthy weight
- Not drinking too much alcohol
- Eating plenty of vegetables, fruits and whole grains
- Vaccination against certain infectious diseases
- Not eating too much processed and red meat
- Avoiding too much sunlight exposure
What is Cancer

In 2015, about 90.5 million people (alive) had cancer.

About 14.1 million new cases occur a year (not including skin cancer other than melanoma).

It caused about 8.8 million deaths (15.7% of deaths).
What is Cancer

In 2012, about 165,000 children under 15 years of age were diagnosed with cancer.

The risk of cancer increases significantly with age and many cancers occur more commonly in developed countries.
What is Cancer

The most common types of cancer in **males** are:

- Lung cancer
- Prostate cancer
- Colorectal cancer
- Stomach cancer.
What is Cancer

The most common types of cancer in Females are:

- Breast cancer
- Colorectal cancer
- Lung cancer
- Cervical cancer
Men: All sites 854,790 (100%)
- Prostate (28%)
- Lung & bronchus (14%)
- Colon & rectum (9%)
- Urinary bladder (6%)
- Melanoma of the skin (5%)
- Kidney & renal pelvis (5%)
- Non-Hodgkin lymphoma (4%)
- Oral cavity & pharynx (3%)
- Leukemia (3%)
- Pancreas (3%)

Women: All sites 805,500 (100%)
- Female Breast (29%)
- Lung & bronchus (14%)
- Colon & rectum (9%)
- Uterine corpus (6%)
- Thyroid (6%)
- Non-Hodgkin lymphoma (4%)
- Melanoma of the skin (4%)
- Kidney & renal pelvis (3%)
- Pancreas (3%)
- Ovary (3%)
What is Cancer

The financial costs of cancer were estimated at $1.16 trillion per year as of 2010.

Cancer has existed for all of human history.
Lung Cancer

A squamous-cell carcinoma (the whitish tumor) near the bronchi in a lung specimen
Colon Cancer

An invasive colorectal carcinoma in a colectomy specimen
Breast Cancer

A large invasive ductal carcinoma in a mastectomy specimen
Cancer Epidemiology

Death from cancer per million persons in 2012

- 135–367
- 368–443
- 444–521
- 522–588
- 589–736
- 737–968
- 969–1,567
- 1,568–2,085
- 2,086–2,567
- 2,568–3,320
What is Diabetes

Diabetes mellitus (DM), commonly referred to as diabetes is a group of metabolic disorders in which the body's ability to produce or respond to the hormone insulin is impaired.

- Resulting in abnormal metabolism of carbohydrates and elevated levels of glucose in the blood and urine.
What is Diabetes

If left untreated, diabetes can cause many complications.

Acute complications can include:

- Diabetic ketoacidosis:
  - High blood sugar (hyperglycemia), low insulin, and the presence of moderate to large amounts of ketones in the blood

- Hyperosmolar hyperglycemic state:
  - Your body gets rid of the extra sugar through your urine. This leads to severe dehydration

- Death
What is Diabetes

Serious long-term complications include:

- Cardiovascular disease
- Stroke
- Chronic kidney disease
- Foot ulcers
- Damage to the eyes:
  - Including retinopathy, macular edema, cataracts, glaucoma, and blindness
What is Diabetes

Diabetes is due to either the pancreas not producing enough insulin or the cells of the body not responding properly to the insulin produced.

There are three main types of diabetes mellitus.

- Type 1 DM
- Type 2 DM
- Gestational Diabetes
What is Diabetes

Type 1DM

The pancreas's fails to produce enough insulin.

This form was previously referred to as "insulin-dependent diabetes mellitus" (IDDM) or "juvenile diabetes".

The cause is unknown.

Managed with insulin injections.
What is Diabetes

Type 2 DM

Begins with **insulin resistance**, a condition in which cells fail to respond to insulin properly.

As the disease progresses a lack of insulin may also develop.

This form was previously referred to as "non insulin-dependent diabetes mellitus" (NIDDM) or "adult-onset diabetes".

The most common cause is excessive body weight and insufficient exercise.
What is Diabetes

Type 2 DM

May be treated with medications with or without insulin.

Insulin and some oral medications can cause low blood sugar.

Weight loss surgery in those with obesity is sometimes an effective measure in those with type 2 DM.
What is Diabetes

Gestational Diabetes

The third main form, and occurs when pregnant women without a previous history of diabetes develop high blood sugar levels.

Gestational diabetes usually resolves after the birth of the baby.

2 HOURS OF UNCOMFORTABLE SLEEP + A LOUSY 20-MINUTE NAP =

AN INCREASED DESIRE TO KICK YOUR HAPPILY SNORING HUSBAND
What is Diabetes

Symptoms may develop rapidly:

- Weeks or months in type 1DM
- They usually develop much more slowly and may be subtle or absent in type 2 DM.
What is Diabetes

The classic symptoms of untreated diabetes are:

- Weight loss
- Polyuria (increased urination)
- Polydipsia (increased thirst)
- Polyphagia (increased hunger)
What is Diabetes

Signs and symptoms can mark the onset of diabetes although they are not specific to the disease.

In addition to the known ones already mentioned, they include:

- Blurry vision
- Headache
- Fatigue
What is Diabetes

Signs and symptoms can mark the onset of diabetes although they are not specific to the disease (continued).

- Slow healing of cuts
- Itchy skin
- Prolonged high blood glucose can cause glucose absorption in the lens of the eye, which leads to changes in its shape, resulting in vision changes.
- A number of skin rashes that can occur in diabetes are collectively known as diabetic dermadromes.
Symptoms of Diabetes

Main symptoms of Diabetes

Central
- Polydipsia
- Polyphagia
- Lethargy
- Stupor

Systemic
- Weight loss

Eyes
- Blurred vision

Breath
- Smell of acetone

Respiratory
- Kussmaul breathing (hyper-ventilation)

Gastric
- Nausea
- Vomiting
- Abdominal pain

Urinary
- Polyuria
- Glycosuria

blue = more common in Type 1
DIABETES
KNOW THE SYMPTOMS

Always tired.
Frequent urination.
Always hungry.
Blurry vision.
Sudden weight loss.
Wounds that won't heal.
Always thirsty.
Numb or tingling hands or feet.
Sexual problems.
Vaginal infections.
What is Diabetes

Comparison of type 1 and 2 diabetes

<table>
<thead>
<tr>
<th>Feature</th>
<th>Type 1 diabetes</th>
<th>Type 2 diabetes</th>
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<tbody>
<tr>
<td>Onset</td>
<td>Sudden</td>
<td>Gradual</td>
</tr>
<tr>
<td>Age at onset</td>
<td>Mostly in children</td>
<td>Mostly in adults</td>
</tr>
<tr>
<td>Body size</td>
<td>Thin or normal[^32]</td>
<td>Often obese</td>
</tr>
<tr>
<td>Ketoacidosis</td>
<td>Common</td>
<td>Rare</td>
</tr>
<tr>
<td>Autoantibodies</td>
<td>Usually present</td>
<td>Absent</td>
</tr>
<tr>
<td>Endogenous insulin</td>
<td>Low or absent</td>
<td>Normal, decreased or increased</td>
</tr>
<tr>
<td>Concordance in identical twins</td>
<td>50%</td>
<td>90%</td>
</tr>
<tr>
<td>Prevalence</td>
<td>~10%</td>
<td>~90%</td>
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What is Diabetes

As of 2015 an estimated 415 million people had diabetes worldwide.

- Type 2 DM making up about 90% of the cases.

This represents 8.3% of the adult population, with equal rates in both women and men.

As of 2014, trends suggested the rate will continue to rise.
Diabetes Death Rate

Diabetes at least doubles a person's risk of early death.

From 2012 to 2015, approximately 1.5 to 5.0 million deaths each year resulted from diabetes.
Diabetes Death Rate

In the United States, diabetes cost $245 billion in 2012.

The global economic cost of diabetes in 2014 was estimated to be $612 billion.
Common Sleep Disturbances in Cancer Patients

Among the most common symptoms of Cancer patients:

- 30-50% report sleep problems post treatment
- Even higher during active cancer treatments
- 2-3 times higher than the general population
Common Sleep Disturbances in Cancer Patients

26.2% of survivors met criteria for sleep disorder diagnosis (Faulhaber et al., 2010)

- Higher risk in females

51% of survivors reported sleep disturbances or problems (Andrykowski et al., 1997)

- Did not change over 18 months
- Higher risk in females and older age
Common Sleep Disturbances in Cancer Patients

How frequently patients were bothered by sleep disturbances:

- 58% Not bothered
- 24% Several days
- 10% More than half of the days
- 8% Almost every day

Higher risk in females and those using sleep medications.
Common Sleep Disturbances in Diabetes Patients

Sleep disturbances are common among individuals with diabetes.

When compared with nondiabetics, patients with diabetes report higher rates of insomnia, excessive daytime sleepiness, and sensations in the legs that disturb sleep.

Therefore, it is not surprising that up to 71% of this population complain of poor sleep quality and high rates of hypnotic use.
Common Sleep Disturbances in Diabetes Patients

Multiple factors contribute to insomnia complaints in patients with diabetes.

In type 1 diabetes, rapid changes in glucose levels during sleep can cause awakenings.

For individuals with type 2 diabetes, sleep disturbances may be related to obesity or obesity-associated sleep disorders, such as sleep apnea.
Common Sleep Disturbances in Diabetes Patients

The severity of sleep-disordered breathing, as measured by the AHI correlates with the severity of glucose intolerance, insulin resistance, and diabetes.

Although OSA is the most common type of sleep-disordered breathing, Central Apneas and periodic breathing have been reported in patients with autonomic diabetic neuropathy.
Common Sleep Disturbances in Diabetes Patients

Another common source of disturbed sleep in diabetics is discomfort or pain associated with peripheral neuropathy.

Patients with diabetes, particularly those with peripheral neuropathy, have restless legs syndrome and periodic limb movements.

Hyperglycemia or Hypoglycemia during the night and night sweats may also contribute to disturbed sleep in some patients.
Common Sleep Disturbances in Diabetes Patients

Recognition that the etiology of sleep disruption in diabetes is often multifactorial is essential to the successful evaluation and subsequent treatment of sleep disorders in this population.

The differential diagnosis should include sleep disruptions caused by a combination of comorbid conditions, including:

- Obesity and chronic pain associated with peripheral neuropathy
- Sleep disorders, such as insomnia, sleep-disordered breathing, and restless legs syndrome/periodic limb movements.
Common Sleep Disturbances in Diabetes Patients

Successful management of sleep disorders often requires a multifaceted approach that not only provides relief of symptoms, but also treatment of the common comorbid conditions.
What Does the Patient Need

Negative Consequences

- Mood
  - Depression, anxiety, irritability
- Physical
  - Pain, fatigue
- Cognitive
  - Memory, attention
- Impaired work performance
- Safety concerns
  - Drowsy driving, risk of falls
- Health/immunity
  - Cardiac, stroke, HTN, diabetes
What Does the Patient Need

Drug Therapy???

flurazepam (Dalmane), temazepam (Restoril), triazolam (Halcion), lorazepam (Ativan), clonazepam (Klonopin), oxazepam (Serax), zolpidem (Ambien), eszopiclone (Lunesta), zaleplon (Sonata), ramelteon (Rozerem), trazodone (Desyrel), amitriptyline (Elavil), mirtazapine (Remeron), quetiapine (Seroquel), olanzapine (Zyprexa)
What Does the Patient Need

Risks of Sleep Medications

- Next day drowsiness
- Dizziness
- Light-headedness
- Slowed thinking “fog”
- Risks of tolerance
- Dependence

- Modify our sleep architecture
  - Delayed REM sleep
  - Decreased slow-wave sleep
- Poor knowledge of drug-drug interactions
- Long-term trials have not been conducted
What Does the Patient Need

Sleep Promoting Behaviors

• Stick to a sleep schedule
• Have the right sunlight exposure
• Use your bedroom only for sleeping and sex
• Avoid caffeine and nicotine
• Don’t take naps after 3 p.m.
What Does the Patient Need

Sleep Promoting Behaviors

- Exercise is great, but not too late in the day
- Avoid alcoholic drinks before bed
- Avoid large meals and beverages late at night
- Avoid medicines that delay or disrupt your sleep, if possible
What Does the Patient Need

Sleep Promoting Behaviors

- Relax before bed
- Only dim lighting in evening
- Take a hot bath before bed
- Have a good sleeping environment
- Stay off of the computer
What Does the Patient Need

Cognitive Behavioral Therapy (CBT)
What Does the Patient Need

Summary of what patients with Cancer or Diabetes need from us:

- Sleep problems are common
- Often maintained by modifiable behavioral & cognitive factors
- Sleep medication use is common but have side-effects and risks
- See a sleep specialist if problem persists
Conclusions

Sleep disturbances are common and can be detrimental to the health, mood, and quality of life of people with cancer and diabetes.

Sleep-disordered breathing, pain, restless legs syndrome, primary insomnia, and lifestyle factors all contribute to a high rate of sleep complaints in this population.

Because the etiology of poor sleep quality is often multifactorial and may shift over time, a careful evaluation for insomnia, sleep-disordered breathing, and restless legs syndrome should be an integral part of the routine care of patients with cancer or diabetes.
Conclusions

There is evidence that treatment of sleep disorders, such as sleep apnea, can improve glucose control and insulin sensitivity.

Advances in behavioral therapy for insomnia, as well as improved safety and tolerability of the newer hypnotic agents and better control of neuropathic symptoms, have resulted in improvements in the management of sleep disruption in diabetics.

Treatment of these common sleep disorders and education regarding healthy sleep behaviors can improve the health and quality of life of patients with cancer or diabetes.
Questions?
Acknowledgments

Priority Health Education.com
Professional Training & Learning Resource Center

GRU Cancer Center
Augusta, GA