

# Prescription Drug Addiction

## Overview

# Medication Consumption

- About 5-6% of all legally available, prescribed medications are potentially addictive
- About 1/3 of psychotropic medications (e.g. benzodiazepines and barbiturates) produce symptoms of addiction if taken over a longer period of time and cause massive withdrawal symptoms if their consumption is stopped suddenly

# Medication Consumption

- The quantities of consumption are very dependent on sex and age:
- Older and female patients take 2-3 times more medications than the rest of the patient population

# Medication Consumption - Prevalence (Germany, 2003)

- 20.4% of women and 13.3% of men take medications once a week
- 4.3% of the polled patients exhibited problematic medication consumption (5.5% of the women, 3.2% of the men)
- About 1.3-1.9 million people in Germany are addicted to prescription medications.  
Ratio women:men = 3:1



# Medication Consumption

- Pain relieving medications (Analgesia) are often taken for their sedative and sleep inducing properties
- The basis for high pill consumption is often found in childhood through the frequent administration of pain killers!

# Analgesia (Pain Killers)

- Peripherally active analgesia
- Migraine medications
- Centrally active analgesia

# Peripherally Active Analgesia

- Prevent pain at its point of origin in the peripheral (=outer) nervous system
- Fever reduction and anti-inflammatory actions
- Receptor free action
- Used for headaches and common colds
- Up to intermediate level pain

# Peripherally Active Analgesia

- Addictive potential arises primarily in combination with psychoactive substances
  - e.g. codeine, caffeine, and alcohol
- Medications with only one active ingredient are favorable to combination medications!



# Peripherally Active Analgesia

- Misusage causes a dull, constant, pressure head ache  
(possible begin of the vicious circle)
- Dangers of repression of pain
- Pain should be taken seriously as a warning signal!
- After long term constant use: possible organ damage to analgesia nephropathy (kidney failure)

# Migraine Medications

- Acetylsalicylic acid=ASA (Aspirin®), Ibuprofen, Triptane, Paracetamol (Mexalen®)
- Danger of overdose through misuse for intense pain
- Symptoms of poisoning:
  - headache, nausea and vomiting
- In extreme cases organ damage:
  - damage to the mucous membrane of the stomach with ulcers
  - kidney and liver damage through over doses with paracetamol

# Centrally Active Analgesia

- Block the transmission of pain impulses in the spinal cord and brain
- Centrally active analgesia are covered by narcotic control laws
- Use for intense and/or chronic pain
- By inappropriate use there is a high potential of addiction

# Centrally Active Analgesia

- Opiates: active agent is derived from the opium poppy (e.g. Morphine)
- There are also semi synthetic derivatives, fully synthetic substances, and animal peptides with opiate-like actions
- Opioids: umbrella term for all of these substances



# Centrally Active Analgesia

- Most frequently prescribed medications (2003):
  - Tramadol (z.B. Tramadol®)
  - Morphine (z.B. MST Mundipharma®)
  - Buprenorphine (Subutex®)
  - Fentanyl (Durogesic®)
  - Oxycodone (Oxygesic®)
- Slow-release capsules

# Centrally Active Analgesia

- Used as maintenance medication for long term therapy of patients addicted to opioids
- Goals: prevention of withdrawal symptoms and reduction of attendant symptoms
- Different effects with individual characteristics are possible depending on the substance and dose
- Examples: elimination of fear, apathy, feelings of tension, euphoria, contentedness, various levels of sedation

# Centrally Active Analgesia

- Long term therapy of pain patients:
  - Risk of addiction does not significantly increase with the duration of the treatment but ongoing controls of the effectivity and tolerance are essential
- Misuse/Abuse:
  - Effects on state consciousness (euphoria) create a strong addictive potential
  - Addiction develops very quickly

# Centrally Active Analgesia

- Possible side effects: nausea, fatigue
- Atypical courses: e.g. fear, dysphoria
- Narrow doses range  $\Rightarrow$  the greatest danger by overdoses is respiratory paralysis with loss of consciousness and coma resulting
- Harm is very rare when therapeutically administered
- Misuse can lead to a chronic toxicity with resulting brain damage



# Consumption of Analgesia During Pregnancy

## Opioids:

- No teratogenic effects on the fetus
- Neonatal Abstinence Syndrome (NAS) is possible
- Opioid maintenance therapy is highly recommended to addicted women during pregnancy
- Danger of lack of treatment: fluctuations in the blood level of opioids for the woman and the fetus lead to a higher rate of premature births and miscarriages

# Sedatives and Hypnotics

- Hypnotics: symptomatic therapy for sleep disturbances
- Sedatives: primarily used to calm patients
- Tranquilizer:
  - primarily used to reduce fear and anxiety
  - sedation for serious somatic illnesses, alcohol withdrawal, and before operations
- The group of medications (along with antidepressants) most often prescribed to older women
- Fluent transition between the different medication groups (multiple actions)

# Hypnotics

- The following substances are categorized as hypnotics:
  - Herbal sleeping aids such as valerian, hops, melissa, etc.
  - Chloral hydrate
    - hardly used anymore because of its extremely long half-life causing a hangover the next day
  - Antihistamine (older Types)
    - fatigue as side effect
  - Tranquilizers with more sedative and less anxiety reducing effects
  - Benzodiazepines

# Sedatives

- The following substances are categorized as sedatives:
  - Benzodiazepines: e.g. Midazolam (Dormicum®), Diazepam (Valium®)
  - Barbiturates: e.g. Phenobarbital (Luminal®)  
⇒ today they are hardly used as sedatives, but rather as antiepileptic drugs
  - Tranquilizers with sedative action
  - Also narcotics, opioids, and antipsychotic drugs with sedative action



# Sedatives

- Ceiling Effect: a significant loss of action is possible after a few weeks of use  
= further increases in doses no longer lead to increased actions; a change to another medication may be necessary
- Paradox Action: instead of sedation, agitation and excitement are caused; administration should be stopped immediately and change to another medication is necessary
- High potential for misuse and addiction

# Tranquilizers

- A group of medications with anxiety reducing (=anxiolytic) and relaxing (=sedative) actions
- Indications:
  - Acute anxiety attacks
- The following substances are categorized as tranquilizers:
  - Benzodiazepines
  - Non-Benzodiazepine Tranquilizers: e.g.: Buspirone
  - Antipsychotic drugs with low potency and in low doses
  - Some beta-blockers
  - Some antidepressants
  - Some herbal substances, e.g. valerian

# Tranquilizers

- Potential danger of misuse and addiction
- Side Effects:
  - Changes in alertness, capacity of reaction, and emotional distance from surroundings
  - Impairment of vegetative functions such as blood pressure, pulse, muscle tension, balance, etc.
  - Impaired in traffic and the operation of machines especially pronounced!
  - Life threatening intoxications are possible in combination with other addictive substances

# Benzodiazepines

- 10-17% of the population of Germany take a benzodiazepine at least once a year
- 1-2% of adult Germans take a benzodiazepine daily for at least one year
- Approx. 1.1 million Germans are addicted to benzodiazepines



# Benzodiazepines

- In 80% of cases, the medication was taken for 3 months or more (Bundes-Gesundheitssurvey 1998)
- The risk of addiction rises with increasing durations of use
- Indications: 50% Sleep disturbances, 25% arousal, states of tension, inner agitation, and nervousness

# Benzodiazepines

- Actions:
  - Relaxation, anxiolysis = reduction of anxiety, sleep stimulating, use before operations
- Side Effects:
  - Fatigue, obnubilation, reduced sexual desires
- Addiction (esp. multiple substance addictions):
  - Complex intoxications and brain damage are possible
  - Massive sedation to respiratory paralysis, loss of consciousness, coma and death are possible particularly in combination with opioids and/or alcohol

# Benzodiazepines

## Most often sold, 2003:

- Radedorm®
- Noctamid®
- Lendormin®
- Flunitrazepam-ratiopharm®
- Remestan®
- Planum®
- Rohypnol®
- Dalmadorm®

## Most frequently abused:

- Lorazepam
- Bromazepam
- Oxazepam
- Flunitrazepam
- Diazepam (=Valium ®)

# Benzodiazepines

- Short and ultra-short acting benzodiazepines :
  - Half-life of 2-14 hours for short term treatment of disturbances in falling asleep
- Medium acting benzodiazepines:
  - Half-life of 15-24 hours for short term treatment of disturbances in falling asleep and sleeping through
- Long acting benzodiazepines:
  - Half-life of up to 45 hours to calm and sedate during extremely agitated states and seizures (e.g. alcohol withdrawal)
- Presently, there is a continual reduction in the number of prescriptions written
- Prescriptions are not written too often, but rather for too long a time



# Benzodiazepines

- Low dose dependence is the most common form  
= long term administration according to prescription to prevent withdrawal symptoms
- High dose dependence  
= noticeable dose increase is necessary, severe withdrawal symptoms
- Multi-substance addiction is frequent, when multiple substances are consumed
  - e.g. alcohol + benzodiazepine + nicotine
- Symptoms of multi-substance abuses are dependent on age, dose, and duration:  
very severe withdrawal symptoms are possible (faintness, dizziness, shivering, sleep disturbances, and agitation), increased disposition for anxiety with panic attacks, withdrawal delirium, and withdrawal psychoses

# Benzodiazepine Use During Pregnancy

- Deformities of the face are frequent when taken during the first trimester
  - Withdrawal syndrome in new born babies are common when long and continuous consumption occurred during pregnancy
  - Neonatal Abstinence Syndrome (NAS) is very intensive and has the longest duration (e.g. in comparison to opioids)
- ⇒ When possible, benzodiazepine therapy during pregnancy should only be short term and selective

# Multi-Substance Abuse

- Single substance addiction is rare
- Multiple substances are usually consumed
- An additional medication addiction (usually benzodiazepines) is especially frequent among opioid dependent patients
- Partial withdrawal is some times indicated (as a gradual, successive detoxification or as a short term intervention)
- Therapy schema should be individually created to treat the patient's spectrum illness