Chronic Kidney Disease

Dental Management

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CHRONIC KIDNEY DISEASE

- Chronic kidney disease (CKD) — term that encompasses all degrees of decreased renal function, from damaged through mild, moderate, and severe chronic kidney failure
- CKD - associated with increased risk of cardiovascular disease and chronic renal failure
- Treatment of CKD includes dietary changes, correction of systemic complications, and dialysis or the receipt of a renal graft in severe cases

CHRONIC KIDNEY DISEASE

- Definition: 3 months of reduced glomerular filtration rate (GFR) and / or kidney damage (abnormal pathology, blood/urine markers, or imaging)
- Chronic renal disease (CRD) is the renal disease that manifests oral consequences most frequently

CKD COMPLICATIONS

- Anemia => due to lack Erythropoeitien
- Hyperkalemia (High Blood Potassium)
- Hyperphosphatemia (abnormally high serum phosphate levels) / Hypocalcemia
- Acidemia (the state of low blood pH)
- Low Vit D / Secondary Hyperparathyroidism / renal osteodystrophy
- Edema
- Uremia (urine in the blood)

SIGNIFICANCE OF CKD IN DENTAL MANAGEMENT

- Importance of CKD for the dental practitioner: lies in the fact that Up to 90% of the pts will show oral signs and symptoms & will require dental treatment
- Dental management must be adapted to these patients' special conditions:
  - increased bleeding tendency,
  - Hypertension
  - Anemia
  - drug intolerance
  - Increased susceptibility to infections

SIGNIFICANCE OF CKD IN DENTAL MANAGEMENT

- CKD is progressive, pts have varying levels of renal function but do not yet have end-stage renal disease

- Care needs to be taken when prescribing medications as they may worsen a patient's renal function, lead to drug toxicity or both

- Thorough medical history and drug history cannot be emphasized enough

GENERAL CONCEPTS

- Consult with physician regarding pt's medical status and restrictions
- Avoid dental treatment if disease is unstable (poorly controlled or advanced)
- Screen for bleeding disorder before surgery (bleeding time, platelet count, hematocrit, hemoglobin)
- Monitor blood pressure closely
- Pay meticulous attention to good surgical technique

DENTAL MANAGEMENT OF THE PATIENT WITH CKD (INCLUDING EMERGENCY DENTAL CARE)

UNDER CONSERVATIVE CARE :

- Avoid nephrotoxic drugs (acetaminophen (Tylenol) in high doses, aspirin, non-steroidal anti-inflammatory drugs)
- Adjust dosage of drugs metabolized by the kidney according to their GFR or Creatinine Clearance (88–128 mL/min for healthy women and 97–137 mL/min for healthy men)
- Aggressively manage orofacial infections with culture and sensitivity tests and antibiotics
- Consider hospitalization for severe infection or major procedures

DENTAL MANAGEMENT OF THE PATIENT WITH ESRD

- The goals of dental care for pts receiving conservative treatment for ESRD are to restore the mouth to the healthiest condition possible and to eliminate possible sources of infection
- Recall appointments need to be more frequent when salivary flow rates are diminished to reduce the development of oral infections and periodontal disease
- Once an acceptable level of oral hygiene has been established, no contraindication exists to routine dental care

DENTAL MANAGEMENT OF THE PATIENT ON HEMODIALYSIS

- Same as conservative care recommendations
- Certain concerns of arteriovenous fistula
    - Consult with physician about risk for infective endarteritis or endocarditis
    - Avoid blood pressure cuff in arm with shunt
- Avoid dental care on day of treatment (especially within first 6 hours afterward); best to treat on day after
- Consider antimicrobial prophylaxis
- Assess status of liver function and presence of opportunistic infection in these pts because of increased risk for carrier state of hepatitis B and C viruses and human immunodeficiency virus (HIV)

ORAL COMPLICATIONS AND MANIFESTATIONS OF CKD & ESRD

Several oral changes are seen with CKD / ESRD:

- Pallor of oral mucosa (Related to anemia)
- Xerostomia
- Pigmentation of oral mucosa
- Parotid infections
- Dysgeusia
- Candidiasis
- Petechiae and ecchymosis of oral mucosa
- Enamel hypoplasia
- Osteodystrophy (radiolucent jaw lesions)
- Uremic stomatitis

ORAL COMPLICATIONS AND MANIFESTATIONS OF CKD & ESRD

- **Pallor of oral mucosa:**

  Related to anemia

  Red-orange discoloration of the cheeks and mucosa caused by pruritus and deposition of carotene-like pigments occurs when renal filtration is decreased.

ORAL COMPLICATIONS AND MANIFESTATIONS OF CKD & ESRD

- **<u>Xerostomia:</u>**

  Salivary flow may be diminished, resulting in xerostomia and parotid infections

  Candidiasis is more frequent when salivary flow is diminished

  Patients frequently complain of an altered or metallic taste, and the saliva may have a characteristic ammonia-like odor that results from a high urea content

ORAL COMPLICATIONS AND MANIFESTATIONS OF CKD & ESRD

- In severe failure, uremic **stomatitis** may be present, characterized early by red, burning mucosa covered with gray exudates and later by frank ulceration

- White patches called ***uremic*** *frost caused by urea crystal deposition are* more common on the skin but may be seen on the oral mucosa. These mucosal changes are generally associated with **blood urea nitrogen (**BUN**)** levels greater than 55 mg/dL

ORAL COMPLICATIONS AND MANIFESTATIONS OF CKD & ESRD

- Bleeding tendencies are evident as **petechiae** and **ecchymoses** on the labial and buccal mucosa, soft palate, and margins of the tongue, as is gingival bleeding

- **Oral lesions, ulcers, lichen planus** (or lichenoid-like) lesions, hairy tongue, and pyogenic granulomas have all been noted in increased frequency in patients with chronic renal failure

ORAL COMPLICATIONS AND MANIFESTATIONS OF CKD & ESRD

- **Enamel hypoplasia** has been documented in patients with ESRD whose disease began at an early age. In the developing dentition, red-brown discoloration and delayed or altered eruption also have been reported.

- **Tooth erosion** from persistent vomiting may be seen. Caries, however, is not a feature because salivary urea inhibits the metabolic end products of bacterial plaque and increases the buffering capacity of saliva, thus preventing a drop in pH sufficient to attain cariogenic levels.

ORAL COMPLICATIONS AND MANIFESTATIONS OF CKD & ESRD

- Specific osseous changes of the jaws accompany chronic renal failure. The most classically described osseous change is the triad of **loss of lamina dura, demineralized bone (“ground glass”), and localized radiolucent jaw lesions** (central giant cell granulomas; “brown tumor”)

- **Lytic bone lesions** are the result of hyperparathyroidism. Other osseous findings include widened trabeculations, loss of cortication and calcified extraction sites (“socket sclerosis”).

ORAL COMPLICATIONS AND MANIFESTATIONS IN HD Pts

- Hemodialysis reverses many of the severe oral manifestations associated with ESRD
- However, uremic odor, dry mouth, taste change, and tongue and mucosal pain are symptoms that persist in many of these pts
- Petechiae, ecchymosis, higher plaque and calculus indices, and lower levels of salivary secretion occur among pts undergoing hemodialysis more frequently than among healthy pts

BASIC CONCEPTS IN HD PATIENTS WITH AVF

- Hemodialysis tends to aggravate bleeding tendencies through physical destruction of platelets and the use of heparin. Therefore, determination of the status of hemostasis is important before oral surgery is performed.
- Activated partial thromboplastin time (aPTT), and platelet count, should be ordered

BASIC CONCEPTS IN HD PATIENTS WITH AVF

- Although increased risk for bleeding is anticipated in these pts, the clinician can perform several management modifications that will reduce the risk. These include the following:
  - Providing dental treatment at the optimum time, usually on the day after hemodialysis, because on the day of dialysis, patients are generally fatigued and may have a tendency to bleed.
  - The activity of heparin lasts for 6hs after infusion, and delay of treatment is prudent until that medication is eliminated from the bloodstream

BASIC CONCEPTS IN HD PATIENTS WITH AVF (CONT'D)

- Obtaining primary closure and, as needed, the use of pressure and hemostatic agents such as thrombin, oxidized cellulose, desmopressin, and tranexamic acid
- Performing major surgical procedures on the day after the end of the week of hemodialysis treatment to provide additional time for clot retention before dialysis is resumed. For example, on a Monday/ Wednesday/Friday weekly hemodialysis regimen, surgery performed on Saturday allows an additional day for clot stabilization before hemodialysis is resumed on Monday of the following week

INFECTIVE ENDOCARDITIS IN HD PATIENTS

- Infective endocarditis occurs in 2% - 9% of HD
- Approximately 7% - 10% are caused by organisms that can arise from the oral cavity (Staphylococcous Aureus, Streptococcus viridans)
- Due to apparent low risk, the American Heart Association (AHA) guidelines do not include a recommendation for prophylactic antibiotics before invasive dental procedures are performed on pts with intravascular access devices

PATIENT RECEIVING DIALYSIS
MEDICAL CONSIDERATIONS

- If prophylaxis is selected, the standard regimen of the current AHA guidelines should be used
- Discuss with pt's Nephrologist to adjust according to renal dose

Antibiotic Prophylaxis Recommendations for Use With Placement of Nonvalvular Cardiovascular Devices

PRIMARY PROPHYLAXIS

- Modeled after that used to prevent surgical site infection
- Because of the low incidence of infection with many of the devices, evidence-based data have not been collected that prove efficacy
- Routinely used for placement of electrophysiologic cardiac devices, ventricular assist devices, total artificial hearts, ventriculoatrial shunts, cardiac suture line pledgets, vascular grafts, and arterial patches

SECONDARY PROPHYLAXIS

- Antibiotic prophylaxis is not routinely recommended after device placement for patients who undergo dental, respiratory, gastrointestinal, or genitourinary procedures
- It is recommended for patients with these devices if they undergo incision and drainage of infection at other sites (e.g., abscess) or replacement of an infected device
- It is recommended for patients with residual leak after device placement for attempted closure of the leak associated with patent ductus arteriosus, atrial septal defect, or ventricular septal defect

RENAL TRANSPLANT PATIENTS

- Meticulous oral hygiene and frequent professional prophylaxis will help to reduce the effects of cyclosporine-induced gingival enlargement

- In general, pts with chronic renal failure exhibit increased susceptibility to gingivitis and periodontal disease

SUMMARIZED TABLES

DENTAL MANAGEMENT OF THE PATIENT RECEIVING HEMODIALYSIS	
SITUATION	**ATTITUDE**
Patient with medical problems treated by other professionals	- Consultation with the nephrologist - Accurate medical history (medication prescribed)
High prevalence of arterial hypertension	Monitorization of blood pressure pre and postoperatively
Platelet dysfunction and anemia (bleeding tendency)	- Request hemostatic study before planning the surgery (time of bleeding, platelet recount, hematocrite, hemoglobin) - Local hemostatic measures
Heparin anticoagulation	Perform dental treatment the day not receiving dialysis, to be sure that there is no heparin in the blood (mean life of 6 hours)
Vascular access for hemodialysis	Avoid compression on the arm with the vascular access and never use it to measure blood pressure nor administering drugs intravenously
Disturbances in the metabolism and removal of drugs	Some drugs must not be prescribed and some need dose adjustment. Request the CC to estimate the GFR (see Table 1)
Renal osteodystrophy due to secondary hyperparathyroidism (late sign of chronic renal insufficiency)	- Bone more susceptible to fractures - Careful dental extraction technique to avoid fractures

SUMMARIZED TABLES

DENTAL MANAGEMENT OF THE RENAL TRANSPLANT PATIENT

SITUATION	ATTITUDE
Patient with medical problems treated by other professionals	- Consultation with the nephrologist - Accurate medical history (medication prescribed)
High prevalence of arterial hypertension	Monitorization of blood pressure pre and postoperatively
Platelet dysfunction and anemia (bleeding tendency)	- Request hemostatic study before planning the surgery (time of bleeding, platelet recount, hematocrite, hemoglobin) - Local hemostatic measures
Corticosteroid therapy	Risk of adrenal crisis if they are in a long- standing corticosteroid therapy: morning appointments and consider the need of supplemental corticosteroids
Immunossuppression	Prescribe antibiotic prophylaxis, if recommended by the nephrologist, prior to certain treatments: tooth extractions, periodontal treatments, subgingival placement of fibers or strips with antibiotic, placement of orthodontic bands and intraligamentous injections of local anesthesic
Disturbances in the metabolism and removal of drugs	Some drugs must not be prescribed and some need dose adjustment. Request the CC to estimate the GFR (see Table 1)
Gingival overgrowth (cyclosporin, nifedipin)	Perform exhaustive examinations of the gums and promote good oral hygiene. Consider surgical treatment

Thank You