Selective Serotonin Reuptake Inhibitors (SSRIs) and Bruxism in HIV+ Dental Patients
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The Russell Street Dental Clinic (RSC) is a community based dental program operated by the Oregon Health & Science University School of Dentistry.

RSC provides routine comprehensive primary dental care and urgent care services. Treatment is provided by faculty/staff dentists and hygienists or dental students under the supervision of faculty dentists and hygienists.

About 35% of RSC patients are People Living with HIV (PLWH). Many receive comprehensive oral health care as part of Ryan White Part A funded services to clients whose income is below 200% of the Federal Poverty Guidelines and who live in a four county area around metropolitan Portland, Oregon.
The Russell Street Clinic

- On average, Russell Street treats 800 patients per month.
- Our patients originate from all over Oregon and southwest Washington; with our largest population pool coming from the Portland metropolitan area.
- Russell Street treated 824 PLWHA this year through Care Act Program funds and OHSU resources.
- When fully staffed the clinic averages 20.3 FTE, this includes 2.2 DMD/DDS FTE and 1.73 RDH FTE.
- All clinic employees are OHSU employees.
- The clinic averages 8 classified employees which are AFSCME employees which include the following positions: Dental Assistant II, Patient Access Specialist (PAS), Administrative Coordinator, Patient Account Rep. The clinic averages one unclassified employee, Clinic Administrator,
- 6 Faculty/instructor employees includes dentists and hygienists.
Payer Mix & DCO Contracts/FFS:

Our payer mix is very diverse. We offer a sliding fee schedule for patients based on proof of income; discounts are based on the Federal Poverty Level (FPL).

- **C1** <200% FPL = 40% Discount, **C2**-201-300% FPL = 25% Discount, **C3** >301% FPL = No Discount.

We contract with both The ODS Companies and Capitol Dental Care to provide emergency services for their Standard patient populations under capitation agreements. If we are unable to provide the service within the clinic; we cover the referral costs.

We also treat OHP, CDC, and Open Card Plus patients on a fee-for-service basis; this group has been under recent review as the average reimbursement is only ~30% of our full fees.
The clinic receives grant funding from DHHS’s Heath Resources Services Administration’s (HRSA) HIV/AIDS Bureau under Parts A & F through three specific programs.

**Under Part A**, we contract with Multnomah County Health Department (MCHD) as the sole Oregon dental clinic in the transitional grant area (TGA=Multnomah, Clackamas, Columbia, Washington, Yamhill and Clark, WA counties.) The contract runs from March 1-February 28 each year.
Oral Health and HIV

- Oral Health Problems Are Common Among People Living With HIV/AIDS
- People living with HIV/AIDS (PLWHA) experience a high incidence of common oral health problems (e.g., dental decay/cavities, gingivitis) as well as other oral health problems that are directly related to HIV infection.
- Between 32 and 46 percent of PLWHA will have at least one major HIV-related oral health problem—bacterial, viral, and fungal infections as well as cancer and ulcers—in the course of their disease.
Oral Health and HIV

• Poor oral health can impede food intake and nutrition, leading to poor absorption of HIV medications and leaving PLWHA susceptible to progression of their disease.

• HIV medications have side effects such as dry mouth, which predisposes PLWHA to dental decay, periodontal disease, and fungal infections.

• Bacterial infections (i.e., dental decay and periodontal disease) that begin in the mouth can escalate to systemic infections and harm the heart and other organs if not treated, particularly in PLWHA with severely compromised immune systems.
Oral Health and HIV

- A history of chronic periodontal disease can disrupt diabetic control and lead to a significant increase in the risk of delivering preterm low-birth weight babies.
- Poor oral health can adversely affect quality of life and limit career opportunities and social contact as result of facial appearance and odor.
- When paired with weakened immune systems, lack of dental care puts many PLWHA at high risk for oral diseases and compromised well-being.
Many PLWHA Lack Oral Health Care

- PLWHA have reported high rates of unmet oral health care needs and low utilization of oral health services.
- PLWHA also have more unmet oral health care needs than unmet medical needs.
- Certain groups of PLWHA, such as people of color (especially women and those without dental insurance) are less likely to receive oral health care than others living with HIV.
PLWHA Face Many Barriers to Oral Health Care

Major factors contributing to unmet oral health needs include the following:

• Lack of dental insurance
• Limited financial resources
• Shortage of dentists trained or willing to treat PLWHA
• Shrinking adult dental Medicaid services
• Patient fear of and discomfort with dentists
• Perceived stigma within health care systems
• Lack of awareness of the importance of oral health
Treatment Planning for PLWHA

• When dental treatment is indicated, decisions regarding the appropriateness of ongoing and long-term dental care of patients with HIV infection should take into account the patient's general medical status, and should not be based solely on HIV status.

• The immunocompetent, asymptomatic HIV-infected individual usually does not require any special consideration when planning, and in the provision of, dental treatment.

• However, as the infection advances to AIDS, laboratory test evaluating the progression of HIVD may become important in determining an appropriate treatment plan.
Treatment Planning for PLWHA

• Patients with CD4+lymphocyte counts above 200cells/mm³ usually have their immunologic status assessed at least every 6 months by their physician.

• Those patients with CD4+lymphocyte counts below 200 cells/mm³ usually have appropriate tests performed at least every three months.

• It is important to consider general trends in CD4+lymphocyte counts and other laboratory values, rather than any single value, as counts may vary considerably even on a daily basis.

• Despite more aggressive and earlier dental care and improved immune response (CD4+>350 cells/μL in 55% of patients) and controlled viral load, the presence of dental caries, periodontal disease and oral lesions among HIV infected patients is still significant.

• Regular ongoing dental visits and treatment are critical to minimizing long-term oral health complications and improving oral health related quality of life for people living with HIV disease.
Case Study HIV, Bruxism and SSRI

- Clinical observation suggests that many PLWH are also diagnosed with Bruxism.
- An initial study undertaken at RSC indicates a correlation between HIV status and Bruxism.
- Bruxism is characterized by the involuntary clenching or grinding of the teeth especially during sleep and can cause severe health problems, including the destruction of tooth structure, temporomandibular joint dysfunction, myofascial pain, and severe sleep disturbances.
Case Study HIV, Bruxism and SSRI

• A review of selected dental records indicated co-morbidity of depression and anxiety.
• The RSC study looks at medication lists that may include SSRI to see if the trend is better defined by including SSRI medications as a variable that may contribute increased prevalence of bruxism and the progression of tooth wear that leads to increased dental treatment needs.
• Dental measures from clinical examination will measure the prevalence of bruxism, the degree and intensity of the disease among the patient population at RSC.
Our impressions are that the combination of HIV, medications for HIV treatment, and the impact of SSRI may lead to progressively intense dental attrition.

If our impression is correct, the preventive and restorative treatment needs of PLWH who present with tooth wear and progressive dental disease can be improved by a partnership between Oral health Care Professionals and Medical providers.

Our goal is to create an interprofessional team to address bruxism. This approach can significantly improve the quality of life of PLWH, reduce health care costs both medical and dental.
HIV

• Human Immunodeficiency Virus (HIV) is a virus that causes immune deficiency in humans.
• It can be transmitted from an infected person to an uninfected partner during sexual intercourse or by sharing needles used for injected drugs.
• It can occur during exposure to the blood of an HIV infected person where another person is inoculated with blood such as with transfusions or accidental exposures to blood.
• Impaired immune response to HIV infection leads to the development of opportunistic infections.
• HIV can be fatal if not detected early and treated.
• Fortunately, early detection and diagnosis can lead to successful treatment. There is no cure for HIV, however there are medications that can help People Living with HIV (PLWH) achieve and sustain a high quality of life.
HIV Medication Side Effects

- HIV and medications that PLWH may take have implications for their oral health.
- Most PLWH take a combination of medications to treat and prevent the complications of HIV and/or treat the side effects of the medications themselves.
- Many oral health problems experienced by PLWH are related to the side effects of the medications they take.
- Xerostomia or dry mouth is one of the most significant complications related to HIV and/or the effect of antiretroviral medications.
- Increase incidence of root caries, oral infection, periodontal disease, and loss of teeth can occur.
- Another possible side effect of HIV meds is tooth enamel erosion.
HIV medications can increase tooth wear

- Some HIV drugs can affect sleep, mood or anxiety levels and therefore increase the likelihood of clenching and grinding.
- Dry tooth surfaces are prone to increased wear from clenching and grinding.
- HIV drugs and other medications which cause a dry mouth, leave teeth vulnerable to tooth to tooth contact.
- Dry tooth surfaces also have an increased risk of acid damage (from foods, drinks and drugs).
Bite guard therapy

- Treatment of occlusal-related disorders is often a challenge for both the dentist and the patient.
- These disorders are often difficult to diagnose, as the presenting symptoms can be variable.
- Occlusal splint design and functional bite guard therapy can be considered an example of the art and science of dentistry.
- Once the cause of occlusal-related disorders is identified, this reversible, noninvasive therapy provides both diagnostic information and relief without the problems that often accompany other approaches to care, ie, surgery and extended drug therapy.
- The addition of a medical intervention may compliment and support successful prevention and treatment of bruxism.
Biteguard Therapy
Selective serotonin reuptake inhibitors (SSRIs)

- Studies show that PLWH are more likely than the general population to develop depression and/or anxiety.
- Depression and anxiety affect a person’s ability to follow treatment for HIV/AIDS, as well as quality of life and lifespan.
- While currently available depression and anxiety treatments are generally well tolerated and safe, a class of medications used to treat depression is linked to bruxism.
- Selective serotonin reuptake inhibitors (SSRIs) can improve a wide variety of these conditions and, as a result, are commonly prescribed.
- Selective serotonin reuptake inhibitor (SSRI), includes citalopram (Celexa), sertraline (Zoloft), and fluoxetine (Prozac) venlafaxine (Effexor) and duloxetine (Cymbalta).

Team Approach Bite Guard Therapy

• All clinicians should be aware that SSRI antidepressants may cause bruxism.
• Because PLWH are significantly at risk due to the complex combination of contributing factors, a partnership and collaboration between medical and oral health care providers is necessary to create a health management plan.
• Preventive and restorative therapy can reduce the risk and impact of bruxism.
• Bite guard therapy is most commonly performed to treat bruxism by oral health professionals.
• Medical Providers should consider referring patients Oral Health Care Providers when prescribing SSRI to prevent possible enhanced Bruxism.
Medical management for Bruxism

- Medical professionals have been successful treating the effects of SSRI related bruxism with Buspirone.
- Buspirone is an agonist of the 5-HT1A receptor that increases dopaminergic neuron firing in the ventral tegmental area and increases the synaptic release of dopamine in the prefrontal cortex. These effects ameliorate drug-induced bruxism
- Buspirone can also ameliorate extrapyramidal side effects, such as akathisia and tardive dyskinesia, and this property may be an additional explanation for the bruxism-related effects of the drug.
- Buspirone is used to improve treatment in various psychiatric conditions, and was reported to be very beneficial in bruxism treatment (Bostwick and Jaffee 1999; Jaffee and Bostwick 2000; Stahl 2002; Hudziak and Waterman 2005).
- The interprofessional approach may be the new way to approach a debilitating oral health care problem for PLWA.
Bruxism
Bruxism
Our Study

Bruxism and Enamel Erosion in Patients Treated with HIV Anti-Retroviral Therapy

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Our Study

**Objectives:**

- Severe enamel erosion and bruxism have been observed in patients who are treated with HIV antiretroviral therapy.
- The objective of this study was to elucidate the relationship between HIV anti-retroviral therapy and bruxism.
Aims

• Aim 1: To conduct a qualitative investigation to determine the degree of bruxism and subsequent enamel erosion in patients taking HIV retroviral therapy. This data will be compared to bruxism and subsequent enamel erosion in HIV negative patients.

• Aim 2: To prepare an informational brochure for medical professionals and HIV patients that explains the possible association between bruxism and HIV medication. The brochure will explain preventative measures to avoid enamel erosion and excessive tooth wear.

• Aim 3: To educate medical providers about the possible side effects HIV retroviral therapy and medical management may have on the oral health of their patients.
Materials and Methods

- Recruited patients from Russell Street Dental Clinic in Portland, OR
- Survey Questionnaire:- Gender, Age, HIV status, Current medications,
- Awareness of tooth grinding, Jaw soreness, Tooth or gum soreness, Frequency of headaches
- Clinical Evaluation:- Recorded the degree of wear on each tooth using a scale of 0 – 3. - Individual tooth-wear index was used to rank persons with regard to incisal and occlusal wear without being influenced by the number of missing teeth.
- Data analysis:- Descriptive statistics and Tests of association using SPSS statistics version 20.
Survey and Exam Sheet

- Patient Name
- DOB
- M/F
- HIV (Y/N)
- CD4>500
- T Cell<20
- HIV Meds
- Dx Anxiety
- Dx Depression
- SSRI RX
- Periodontal Dx Cl I-V
- Basic Erosive Wear Examination 0-3
- Smith Knight Score
- Abfraction Y/N
- TX Category Indicated
- No TX
- Restorative Filling
- Crown
- Extraction
Tooth Wear Scoring Index

Tooth wear scoring criteria

- Score 0    No wear or negligible wear of enamel
- Score 1    Obvious wear of enamel or wear through the enamel to the dentine in single spots
- Score 2    Wear of the dentine up to one-third of the crown height
- Score 3    Wear of the dentine up to more than one-third of the crown height; excessive wear
- of tooth restorative material or dental material in the crown and bridgework
Individual tooth wear index

• Calculated from the scores of incisal or occlusal wear for each tooth of that individual, where G0, G1, G2 and G3 are the number of teeth with scores of 0, 1, 2 and 3, respectively.

10xG1 + 30xG2 + 100xG3/G0 + G1 + G2 +

where G0, G1, G2 and G3 are the number of teeth with scores of 0, 1, 2 and 3, respectively.
Results:

- The study sample involved 104 patients (HIV+ve = 67, HIV−ve = 37) with age range of 20-90yrs (mean=49.6yrs, s.d= 12.9).
- Majority of the patients were males (79%) and many presented with existing psychological disorders (40%).
- HIV+ve patients reported significantly more psychological disorders than the HIV−ve controls (p <0.01).
- Clenching during the day as well as night was significantly higher in HIV+ve patients versus HIV−ve controls (p<0.01).
- The mean tooth wear index was higher in HIV+ve patients than HIV−ve patients (8.19 vs. 5.77), however, this difference was not statistically significant.
Survey characteristics of participants

Figure 5: Characteristics of the participants

- Psychological Disorder
- Clenching During Day
- Smoking
- Teeth/Gum Soreness
- Clenching During Night
- Jaw Soreness
- History of Headaches
- Alcohol Consumption >7/week
- Recreational Drugs Use
- TMD Diagnosis

% ages
Figure 4: HIV status of participants

- HIV -ve: 36%
- HIV +ve: 64%
Bruxism and HIV Status

Figure 7: Association of clenching habit during night and HIV status *

* p=0.010

- HIV -ve: Clenching Habit Present - 13.5, Clenching Habit Absent - 86.5
- HIV +ve: Clenching Habit Present - 37.3, Clenching Habit Absent - 62.7
Daytime Bruxism

Figure 8: Association of clenching habit during day and HIV status *

<table>
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<th>HIV -ve</th>
<th>HIV +ve</th>
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<tbody>
<tr>
<td>Clenching Habit Present</td>
<td>Clenching Habit Absent</td>
</tr>
<tr>
<td>21.6</td>
<td>49.3</td>
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<tr>
<td>78.4</td>
<td>50.7</td>
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* p=0.006

Clenching Habit Present | Clenching Habit Absent
Tooth Wear Index

Figure 9: Tooth wear index by HIV status

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<thead>
<tr>
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<th>HIV+ve</th>
<th>HIV-ve</th>
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<tr>
<td>Tooth Wear Index</td>
<td>8.19</td>
<td>5.77</td>
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Conclusions:

- HIV+ve patients, who are on anti-retroviral therapy, have significantly higher psychological disorders as well as bruxism.

- The findings from this study will be used to initiate a dialogue with medical providers about the possible side effects antiretroviral therapy and to introduce appropriate preventive measures.
References

9. Reported by Russell Street Clinic Director, Jay R. Anderson, DMD, MHSA