Impact of rectal Gonorrhoea and Chlamydia on HIV viral load in the rectum; potential significance for onward transmission

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Anal sex is a major mode of transmission

High rates of asymptomatic rectal CT & GC (Soni STD 2011)

ART reduces HIV onward transmission risk
  * 052: Heterosexual couples (Cohen NEJM 2011)
  * PARTNER: MSM including STI effect (Rodger CROI 2014)

Limited data on influence of ART and bacterial STI on rectal HIV VL
Aims

• To investigate the effect of ART on rectal HIV viral load

• To investigate the effect of asymptomatic rectal bacterial STI on rectal HIV VL and rectal inflammatory cytokines in individuals both on and off ART

• To investigate the effect of treatment of rectal STI on rectal HIV VL and inflammatory cytokines
Methods

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On ART (n=21)
- STI (n=7)
  - CT
  - GC
- No STI (n=14)
  - CT
  - GC

ART naïve (n=21)
- STI (n=7)
  - CT
  - GC
- No STI (n=14)
  - CT
  - GC

6 x PI
14 x NNRTI
1 x CCR5I
Methods

• Clinical samples
  • Rectal samples:
    Rectal swabs taken via proctoscopy: HIV VL, STI, cytokines
  • Plasma HIV viral load

• Those with a rectal STI were re-sampled ≈2 weeks after receiving STI treatment

• 4 rectal samples inhibited the PCR and were excluded from analysis
Rectal HIV VL was quantified using the Roche Cobas TaqMan 48 analyzer and HIV-1 High Pure Extraction System and expressed as copies/µg total RNA.

Plasma HIV VL was measured using the Roche AmpliPrep/Cobas Taqman system.

Quantitative detection of inflammatory cytokines using cytokine array

* IL6, IFNγ, TNF
Results 1: Effect of ART on rectal HIV VL & cytokines

* Rectal VL was < 100 copies/μg in everyone on ART regardless of STI status

* Rectal VL was median 2 log₁₀ lower than plasma VL in ART naïve group

* No difference in rectal inflammatory cytokines between those on ART and those not on ART

<table>
<thead>
<tr>
<th>Cytokine</th>
<th>p value</th>
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<tbody>
<tr>
<td>IL6</td>
<td>0.22</td>
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<tr>
<td>IFNγ</td>
<td>0.09</td>
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<tr>
<td>TNFα</td>
<td>0.63</td>
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Results 2: Effect of STI on rectal HIV VL and cytokine levels

* ART group
  * STI did not increase:
    * rectal HIV VL (All <100 copies/μg)
    * IL-6 (p=0.41), IFNγ (p=0.42), TNFα (p=0.26) expression

* ART naïve group
  * STI did not increase:
    * rectal HIV VL (p=0.5)
    * IL-6 (p=0.12), IFNγ (p=0.16), TNFα (p=0.09) expression
Results 3: Effect of treatment of STI on rectal HIV VL

* In ART group: all rectal VL were <100 copies/μg pre treatment and remained so post treatment

* In ART naïve group: Only 3/7 returned for post Rx tests. Rectal VL fell by 1 log$_{10}$ post treatment in all 3
Results 3: Effect of treatment of STI on cytokines

- **7 post Rx cytokine results**
  - **ART (n=5)**: No pattern to changes in cytokine expression
  - **ART naïve (n=2)**: IL6, TNFa, IFNg concentrations ↓ post Rx
Conclusions

* ART was associated with an undetectable HIV VL in rectum irrespective of ART regime

* Rectal HIV VL and cytokine levels were not significantly higher in patients with rectal CT/GC and rectal VL did not increase at all in those on ART

* This suggests minimal impact of CT/GC on onward transmission of HIV
Acknowledgements

* **Patients**
* **Collaborators**
  * Dr Sinead Costelloe
  * Dr Siobhan O’Shea
  * Dr Juan Tiraboschi
  * Dr John White
  * Dr Julie Fox
* **BHIVA/ Gilead**