5th International HIV/Viral Hepatitis Co-Infection Meeting

HCV micro-elimination in people living with HIV

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Sunday, 21 July 2019, Mexico City, Mexico
<table>
<thead>
<tr>
<th>Company names</th>
<th>Gilead, MSD, Roche, Abbvie</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relations</td>
<td>Unrestricted research grants and speaker’s fee paid to institute Study medication for PrEP demonstration project (AMPPrEP in H-TEAM)</td>
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</tbody>
</table>
Outline

1. Introduction
2. Modelling studies
3. Real-life data
4. Roll-out of comprehensive programs
5. Conclusions
**Aim**: to evaluate whether we are on track to reach the WHO elimination target of an **80% reduction in HCV incidence** among people living with HIV.

**Impact targets for elimination**

- **90% reduction** in new cases of chronic HBV and HCV infection
  - 6-10 million infections (in 2015) to 900,000 infections (by 2030)

- **65% reduction** in deaths from chronic HBV and HCV
  - 1.4 million deaths (in 2015) to under 500,000 deaths (by 2030)

*Source: WHO*
2,278,400 HIV-HCV co-infections worldwide (IQR 1,271,300-4,417,000)

Coinfection prevalence
- PWID 82.4%  
  HCV infection typically precedes HIV
- MSM 6.4%  
  HIV infection typically precedes HCV
- Others 2.4-4.0%  
  \( \text{Platt et al, Lancet ID 2016} \)

If increased risk for HCV transmission was removed from PWID
- 43% of incident HCV infections would be prevented from 2018-2030  
  \( \text{Trickey et al, Lancet Gastroenterol Hepatol 2019} \)

People living with HIV: Priority group for HCV elimination
- HIV coinfection accelerates HCV disease progression and mortality and vice versa

Starting points
Why it may be possible to reduce HCV incidence by 80% in people living with HIV?

DAA treatment
– highly effective

Most individuals living with HIV
– diagnosed
– engaged in clinical care
– remain in routine care
HCV Treatment as Prevention (TasP)
Impact on HCV incidence in people living with HIV
The models
Impact DAA uptake on reduction in HCV incidence among PWID living with HIV

Mathematical Models

**Literature**

|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Conclusion**

- Scaling up of TasP and other prevention measures (OST, NSP) are needed to reduce HCV incidence
- Current HCV testing and treatment coverage rates are generally insufficient to reach the WHO target (80% reduction) in most settings
- HIV (co-) infection is usually not modelled
- HCV elimination among PWID living with HIV requires scale-up of interventions among HIV/HCV coinfected, HCV monoinfected PWID and those at risk
Impact DAA uptake on reduction in HCV incidence among MSM living with HIV

Mathematical Models

<table>
<thead>
<tr>
<th>Literature</th>
<th>Original studies:</th>
</tr>
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<tbody>
<tr>
<td>Specifically acute HCV infection:</td>
<td>Linas et al, CID 2012; Popping et al, PloS One 2019</td>
</tr>
<tr>
<td>HIV+ and HIV- MSM</td>
<td>MacGregor et al, IJE 2017 &amp; AIDS2018; Martin et al, JID 2019</td>
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<tr>
<td>HIV-MSM:</td>
<td>?</td>
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<tr>
<td>Reviews:</td>
<td>Martin et al, Aids Rev 2017 &amp; JIAS 2018</td>
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Conclusion

- Rapid scale-up of DAA might reduce HCV incidence
- Early treatment might further decline incidence
- Decrease is counterbalanced by ongoing risk behaviour
- Sexual behaviour patterns, not biological factors, likely drive HCV epidemic among HIV+ MSM
- HCV among HIV- MSM is almost never modelled
- To reach the WHO target (80% reduction) a decline in risk behaviour is needed in most settings
Modelling the HCV epidemic among HIV+ MSM in Switzerland

DAA upscale could reduce incidence if risk behaviour stabilized or decreased

Salazar-Vizcaya et al, Hepatology 2016
Modelling the HCV epidemic among HIV+ MSM in Berlin

Achieving the WHO target (80% reduction) requires behaviour change

By courtesy of Natasha Martin, July 2019

Martin et al, JID 2019
HCV Treatment as Prevention (TasP)
Impact on HCV incidence in people living with HIV
Real-life data
<table>
<thead>
<tr>
<th>Region</th>
<th>Time Period</th>
<th>DAA uptake</th>
<th>Key HIV+ population</th>
<th>Additional interventions</th>
<th>Outcome: HCV incidence trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switzerland</td>
<td>2005-2016</td>
<td>2016</td>
<td>PWID, MSM</td>
<td>HCV RNA screening of all, behaviour counselling</td>
<td>MSM: continued increase</td>
</tr>
<tr>
<td>Salazar-Vizcaya, OFID 2018</td>
<td>2015-2017</td>
<td>2016</td>
<td>PWID 28/100 py</td>
<td></td>
<td>PWID: continued decrease</td>
</tr>
<tr>
<td>Braun, CROI 2018</td>
<td></td>
<td></td>
<td>MSM</td>
<td></td>
<td>Incidence?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Decline acute cases</td>
</tr>
<tr>
<td>France</td>
<td>2012-2016</td>
<td>2016: 42%</td>
<td>MSM, others</td>
<td></td>
<td>MSM: 1st infection: continued increase</td>
</tr>
<tr>
<td>Pradat, AIDS 2018</td>
<td></td>
<td>(cured 82%)</td>
<td></td>
<td></td>
<td>Reinfection: remained stable</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Others: remained stable</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>2014 vs. 2016</td>
<td></td>
<td>MSM</td>
<td></td>
<td>Decreasing</td>
</tr>
<tr>
<td>Boerekamps, CID 2018</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>no further decline Q1 2017</td>
</tr>
<tr>
<td>Australia</td>
<td>2016-2018</td>
<td>(cured &gt;95%)</td>
<td>Predominantly MSM</td>
<td>primary care treatment, nurse-led model</td>
<td>Continued decrease</td>
</tr>
<tr>
<td>Doyle, EASL 2019</td>
<td>2014-2018</td>
<td>Cumulative 91%</td>
<td>PWID, MSM</td>
<td>primary care treatment, prescriber training and education</td>
<td>Incidence?</td>
</tr>
<tr>
<td>Martinello, AVHC 2019</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Decline chronic prevalence</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very low reinfection incidence</td>
</tr>
<tr>
<td>Canada</td>
<td>2013-2016</td>
<td>Analysis restricted to those with SVR</td>
<td>PWID, MSM</td>
<td></td>
<td>1st infection: not studied</td>
</tr>
<tr>
<td>Young, CID 2018</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Reinfection: stable?</td>
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HCV elimination in HIV population

HCV RNA prevalence among HIV/HCV cohort (antibody +ve)

% HCV RNA+

- 2014: 82% (N=298/362)
- 2015: 79% (N=286/360)
- 2016: 77% (N=291/379)
- 2017: 23% (N=88/377)
- 2018: 9% (N=32/347)

Comprehensive programs
1. CEASE, 4 States, Australia

By courtesy of Gail Matthews, July 2019
Phase
A. Intensified HCV-PCR-based screening of all MSM (the Swiss HIV Cohort Study)
B. Interventions - DAA treatment
   - Behavioural intervention for those using condoms inconsistently with casual partners
C: Re-screening and treatment

Comprehensie programs 2. The Swiss-HCVree-Trial

Braun et al, CROI 2018 (#81LB); Salazar-Vizcaya et al, J Viral Hepat. 2018
City-based approach for MSM

Running projects:
- nomorec.nl online tool and face-to-face strategies
  co-creation with community

Online tool include (nomorec.nl)
- HCV risk reduction information
- Validated HCV-MOSAIC risk score
  Newsum et al, Euro Surveill 2017
- HCV RNA home-based testing service
  - 101 test sold
- Toolbox – order offer
  - 63 boxes distributed

Starting soon:
MOSAIC 3 Real-time monitoring of phylogenetic HCV transmission dynamics and monitoring of sexual network characteristics
ICECREAM 3-arm RT evaluating the effect of (1) online behavioural intervention, (2) patient-initiated, home-based HCV RNA testing service, and (3) its combination on risk behaviour

Prinsenberg et al, Global Hepatitis Summit 2018

Comprehensive programs 3. MCFree, Amsterdam, The Netherlands
Broad access to DAA and additional interventions
- HCV treatment also provided in primary care
- Nurse-led model to facilitate recruitment, HCV assessment, treatment initiation and follow-up
Reasons for differences in HCV incidence trends during the DAA era

Regional differences in:
1. Trend in HCV incidence (pre-dating scale-up of DAA)  
   van Santen en al, J Hepatol 2016
2. Extent of DAA scale up and restrictions
3. Level of risk behaviour
4. HCV introductions from outside and characteristics of transmission networks  
   - Undiagnosed people living with HIV  
   - HIV- populations (PWID and MSM eligible or on PrEP)  
   Hoornenborg et al, AIDS 2017 & AIDSc onference 2018  
   Cotte et al, Liv Int 2018, Pirce et al, JID 2019, Ramiere CID 2019
5. Testing methods and frequency  
   - 1/3 of acute cases with positive HCV RNA: no elevated liver enzyme levels  
   Braun et al, CID 2018
6. Level of availability and scale-up of interventions other than DAA
Are we on track to reach an **80% reduction in HCV incidence** in people living with HIV? **Conclusions**

**Models**
This reduction requires scale-up of HCV treatment and in most settings other interventions among people living with HIV (PWID and MSM), HCV mono-infected individuals and those at risk of HCV

- Treatment of acute HCV infection might be important

Models are needed to provide data on most (cost-)effective combinations of interventions

**Real life data**
Impact of scaling-up DAA varies between regions and key groups

- Might it be too early to see an effect on incidence?
- Undiagnosed persons (HIV+ and HIV-) could fuel the epidemic

Promising results from high-income regions, suggesting HCV treatment scale-up can reduce HCV incidence, but what about low- and middle-income settings?

**Scale-up of combined interventions is the way forward to reach the WHO target**

- PWID: scale up of testing, treatment and comprehensive harm reduction programs
- MSM: scale up of testing, treatment and effective behavioural interventions
Acknowledgements

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Thank You