Dogma: HCV treatment for eradication

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Disclosures

- Some discussion of non-HC approved compounds
- Industry:
 - AbbVie
 - Gilead
- Academic:



 Affiliation with Dalhousie University and Nova Scotia Health Authority

• Advocacy:

- HIV and HCV patient advocacy groups



 Describe an infectious disease plan for the elimination of HCV

• Contrast current oral HCV treatment options, including duration and cure rates

Predict which key populations should be treated to facilitate elimination

Infectious diseases and eradication









Traditional characteristics for infectious disease eradication

- Low R_o
 - Difficult to / not easily spread
 - Susceptibility and protection
 - Naturally induced immunity
 - Vaccine
- Declining prevalence naturally
- Easily diagnosed
- Exposure to symptom time is short
- No animal reservoir

Traditional characteristics Eradication and HCV



No vaccine

Reinfection possible

Incidence ? **V**

Reliably curable

Clinically indolent BUT easily identified if tested

Long exposure-tosymptom time

No animal reservoir

Traditional characteristics Eradication and HCV

Reliably curable

R₀ ~ 2

No vaccine

Reinfection possible

Incidence ? **V**

Clinically indolent BUT easily identified if tested

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Screening challenges









Eradication and HCV: Treatment for cure

R_o ~ 2

No vaccine

Reinfection possible

Incidence ? **V**

Reliably curable

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Long exposure-tosymptom time

No animal reservoir

Ideal HCV treatment

Highly efficacious (cure for all treated) All oral No/low side effects Short Once daily

Accessible

HCV: the direct acting antiviral revolution

Direct acting antivirals



Direct acting antivirals



NS5A inhibitors (eg. ledipasvir, ombitasvir) AND Polymerase inhibitors (eg. sofosbuvir, dasabuvir)

New HCV regimens



Health Canada approved HCV DAA indications

HCV genotype	Sofosbuvir	Sofosbuvir/ledip asvir	Simeprevir	PRV/r/OMV/DSV (RBV)
1a	X (with PEG- IFN/RBV)	X	X (with PEG- IFN/RBV)	X
1b	X (with PEG- IFN/RBV)	X		X
2	X (with RBV)			
3	X (with RBV)			
4	X (with PEG- IFN/RBV)			

Pre-approval: Daclatasvir* in HIV/HCV coinfection



Pre-approval: Grazoprevir*, elbasvir* and riba in HCV genotype 1



* Not yet Health Canada approved

Lawitz et al. 2015 Lancet 385; 1075

New HCV regimens: Key points

Highly efficacious (greater than 90% cure) All oral No/low side effects Short (12 weeks currently, ?shorter) Low pill burden (1 pill-8 pills/day)

Accessible

Treatment for elimination treatment for prevention



Treatment as prevention in 'transmitters': what have we learned in TB



Gallant et al. Canadian communicable diseases report vol 40-6: Mar. 20 2014

Treatment as prevention in 'transmitters': what have we learned in HIV



Cohen MS, Chen YQ, McCauley M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med* 2011;365:493-505

Treatment as prevention in 'transmitters': what about HCV?



Hellard et al. 2014 Hepatology 60: 1861

Treatment as prevention in 'transmitters': what about HCV?

- Treatment as prevention with new DAAs will probably work at the population level for high risk individuals to prevent transmission....but we don't know
- Pilot studies to look at HCV reinfection and its mechanisms (behavioral and immune) are needed

Treatment for elimination treatment for prevention

Reliably curable



R₀ ~ 2

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Treatment for elimination treatment for prevention



HCV infection: decreased prevalence and incidence through treatment and care



HCV 170 million

Curable

Short treatment

worldwide numbers



Trubnikov M, Yan P, Archibald C. Canada Communicable Disease Report. Volume 40-19

HCV infection: decreased prevalence and incidence through treatment and care

Canadian estimate



HCV 220,000-250,000

Identify the reservoir

Treatment of the human reservoir

Treat those with high risk for reinfection

Reduce reinfection risk

Cana Volur

Trubnikov M, Yan P, Archibald C. *Canada Communicable Disease Report*. Volume 40-19

Answering the challenge: principles for HCV eradication

Care providers committed to education and HCV care Engagement of the persons living with HCV community

Industry and government partnership to access treatment Practical and pragmatic evaluation and investigation that promotes ongoing improvement



TORONTO DECLARATION: STRATEGIES TO CONTROL AND ELIMINATE VIRAL HEPATITIS GLOBALLY

9. Set targets for national disease elimination with a comprehensive monitoring and evaluation plan to assess progress

Hepatitis

Eradication

Cure &

You don't have to see the whole staircase, just take the first step.

Martin Luther King, Jr.

VISION A world without HCV

GOAL

Elimination of HCV

Through treatment ? And treatment as prevention? And a vaccine?

