HCV Treatment in the Era of DAA
The Egyptian Experience

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Prof. Hepatology & Vice President of Cairo University, Egypt
Member of WHO Strategic Committee for Viral Hepatitis
www.gamalesmat.com
Ribavirin

Pegylated interferons

Suppression of HCV with DAA combination (PI + NI)

Frequent curability of diverse populations without IFN

Simeprevir or sofosbuvir with IFN (GT1)

First approved IFN-free therapy: Sofosbuvir + RBV

Simeprevir + sofosbuvir (off label use in US and EU)

Interferon

Proof of concept for DAA (PI)

Telaprevir and boceprevir

Daclatasvir (Japan and Europe)

Daclatasvir + sofosbuvir (GT1b)

Ledipasvir + sofosbuvir

Paritaprevir/RTV/ombitasvir + dasabuvir ± RBV

HCV therapy: past, present and future
Evolution of HCV treatment and SVR rates

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>Column 1</th>
<th>Genotype 2/genotype 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>6–19</td>
<td>IFN monotherapy (weeks)</td>
<td>IFN + ribavirin</td>
</tr>
<tr>
<td>2011</td>
<td>31–44</td>
<td>PegIFN</td>
<td>PegIFN + ribavirin</td>
</tr>
<tr>
<td>2013</td>
<td>18–39</td>
<td>PegIFN</td>
<td>SMV or SOF + PegIFN + RBV</td>
</tr>
<tr>
<td>2014/15</td>
<td>95–100</td>
<td>DAA comb</td>
<td>PegIFN + ribavirin</td>
</tr>
</tbody>
</table>

We now have highly efficacious DAAs that target different stages in the HCV lifecycle.

Summary of New England Journal of Medicine studies on IFN-free therapy in GT 1 patients published in 2014

96%

3680/3826

SVR

Lindenbach BD, Rice CM. Nature 2005;436(Suppl):933–8;

DAA: direct-acting antiviral agent; ER: endoplasmic reticulum; GT: genotype; IFN: interferon; LD: luminal domain; NA: nucleos(t)ide analogue; NS: non-structural protein; SVR: sustained virological response

Receptor binding and endocytosis
Fusion and uncoating
Transport and release
Virion assembly
RNA replication
Membranous web
ER lumen
LD
NS3 protease inhibitors
NS5A inhibitors
Non-NA NS5B inhibitors
NA NS5B inhibitors
Translation and polyprotein processing
(+) RNA
Translation and polyprotein processing
Characteristics of DAA

<table>
<thead>
<tr>
<th></th>
<th>PI 1&lt;sup&gt;st&lt;/sup&gt; generation</th>
<th>PI 2&lt;sup&gt;nd&lt;/sup&gt; generation</th>
<th>NS5A Inh. 1&lt;sup&gt;st&lt;/sup&gt; generation</th>
<th>NS5A Inh. 2&lt;sup&gt;nd&lt;/sup&gt; generation</th>
<th>NS5B nucleos(t)ide inh.</th>
<th>NS5B non nucleos(t)ide inh.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficacy</td>
<td>![Good profile]</td>
<td>![Good profile]</td>
<td>![Good profile]</td>
<td>![Good profile]</td>
<td>![Good profile]</td>
<td>![Good profile]</td>
</tr>
<tr>
<td>Resistance</td>
<td>![Least favorable profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
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<tr>
<td>profile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pangentotyping</td>
<td>![Least favorable profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
</tr>
<tr>
<td>efficacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adverse</td>
<td>![Least favorable profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
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<tr>
<td>events</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Drug-drug</td>
<td>![Least favorable profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
<td>![Average profile]</td>
</tr>
<tr>
<td>interaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Good profile**: Green
- **Average profile**: Yellow
- **Least favorable profile**: Red

Currently approved Treatment Choices in the International Label for Patients with HCV GT-4

<table>
<thead>
<tr>
<th>Treatment Choice</th>
<th>+ RBV ?</th>
<th>Duration (weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIM + SOF[^1,^2]</td>
<td>±</td>
<td>12</td>
</tr>
<tr>
<td>DCV + SOF[^1,^2]</td>
<td>±</td>
<td>✓</td>
</tr>
<tr>
<td>SOF/LDV (FDC[^3])</td>
<td>±</td>
<td>✓</td>
</tr>
<tr>
<td>SOF[^2]</td>
<td>✓</td>
<td>-</td>
</tr>
<tr>
<td>SOF/PEG/RBV</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>PARr/OMB</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

* Consideration should be given to potentially extending treatment duration, up to 24 weeks, especially for those subgroups with one or more factors historically associated with lower response rates to IFN-based therapies.

[^1]: Daklinza (Daclatasvir) SmPC, Bristol-Myers Squibb Pharmaceutical Limited, October 2014.
[^2]: Sovaldi (Sofosbuvir) SmPC, Gilead Sciences Ltd, March 2015.
[^3]: Harvoni (LDV/SOF FDC) SmPC, Gilead Sciences Ltd, November 2014.
Non-Nucs

NS5A inhibitors ‘...asvirs’
- Sofosbuvir
- Ledipasvir

Protease inhibitors ‘...previrs’
- Paritaprevir/r
- Ombitasvir +/- Dasabuvir
- Simeprevir
- Sofosbuvir

Polymerase inhibitors ‘...buvirs’
- Sofosbuvir
- Daclatasvir
- Sofosbuvir
- Ledipasvir

N nucleos(t)ide
- Sofosbuvir + RBV

IFN-free regimens available in 2015

HCV G4 the Egyptian Clinical Trials in
AASLD meeting SF 2015

- Sof + RBV
- Sof + PI (Simeprevir)
- Sof + NS5A (Ravidasavir)
- PI(Paritaprevir) + NS5A(Ombitasvir)
HCV G4 the Egyptian Clinical Trials in
AASLD meeting SF 2015

- Sof + RBV
- Sof + PI (Simeprevir)
- Sof + NS5A (Ravidasavir)
- PI(Paritaprevir) + NS5A(Ombitasvir)
Sofosbuvir plus Ribavirin in the Treatment of Egyptian Patients with Chronic Genotype 4 HCV Infection

W.H. Doss, M. Hassany, R. Hammad, National Hepatology and Tropical Medicine Research Institute, Cairo, EGYPT; P.J. Ruane, D. Ain, J. Riad, R. Meshrekey, Ruane Medical and Liver Health Institute, Los Angeles, California, UNITED STATES; R. Soliman, W. Samir, G. Shiha Egyptian Liver Research Institute and Hospital, Mansoura, EGYPT; M. Khairy, R.F. Omar, M. Gamil, G.E. Esmat, University of Cairo, Cairo, EGYPT; D. Jiang, B. Massetto, S.J. Knox, K. Kersey, J.G. McHutchison, Gilead Sciences, Inc., Foster City, California, UNITED STATES
Sofosbuvir + Ribavirin in GT 4

<table>
<thead>
<tr>
<th></th>
<th>SOF + RBV</th>
<th>12 wk</th>
<th>24 wk</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Cirrhosis</td>
<td>53/68</td>
<td>78</td>
<td>92</td>
</tr>
<tr>
<td>Cirrhosis</td>
<td>8/15</td>
<td>53</td>
<td>14/16</td>
</tr>
</tbody>
</table>
Real world experience in the Target cohort: Treatment status by regimen

Total consented in HCV-TARGET 2.0
N=2185

N=2140*

ITT
SOF + PR
N=391

Started
SOF + PR
N=366

Early termination
SOF + PR
N=7

ITT
SOF + RBV
N=692

Started
SOF + RBV
N=645

Early termination
SOF + RBV
N=16

ITT
SMV + SOF
N=831

Started
SMV + SOF
N=697

Early termination
SMV + SOF
N=11

ITT
SMV + SOF + RBV
N=226

Started
SMV + SOF + RBV
N=205

Early termination
SMV + SOF + RBV
N=3

Based on available data as of 10th September 2014
*N=45 Data in processing
ITT= intent-to-treat
11 patients have started other regimens:
1 TVR + PR; 1 BOC + PR; 1 SMV + PR; 1 SOF + PR; 4 PR; 3 DCV + SOF + RBV

HCV G4 the Egyptian Clinical Trials in AASLD meeting SF 2015

- Sof + RBV
- Sof + PI (Simeprevir)
- Sof + NS5A (Ravidasavir)
- PI(Paritaprevir) + NS5A(Ombitasvir)
Treatment of Hepatitis C Genotype 4 patients with Simeprevir and Sofosbuvir: Preliminary Results from a Phase IIa, Partially Randomised, Open-label Trial conducted in Egypt (OSIRIS)

- M. El Raziky, G. Van Dooren, Janssen Infectious Diseases BVBA, Beerse, BELGIUM; M. Gamil, M. Khairy, A. Elsharkawy, Cairo University, Cairo, EGYPT; R. Hammad, M. Hassany, W.H. Doss, National Hepatology and Tropical Medicine Research Institute, Cairo, EGYPT; M. El Raziky, Cairo University, Cairo, EGYPT; M. Saad Hashem, A. Gomaa, I. Waked, National Liver Institute, Menoufiya, EGYPT; S. Keim, Janssen-Cilag Portugal, Lisbon, PORTUGAL; R. Ryan, R. DeMasi, Janssen Research & Development LLC, Titusville, New Jersey, UNITED STATES; I. Londjon-Domanec, Janssen-Cilag, Paris, FRANCE
COSMOS: SVR12 (ITT) in prior null responders, F0–F2

Intent-to-treat population;
Non-VF, Non-virologic failure, patients who did not achieve SVR12 for reasons other than virologic failure

Sulkowski M, et al. EASL 2014 O7
OSIRIS: SMV + SOF in genotype 4 HCV infection in treatment-naïve and treatment-experienced patients (N=60)

- Phase 2, partly randomized, open-label, multicentre study (Egypt)
- SVR4 will be available by the end of this month.

Primary endpoint: SVR12
Sofosbuvir + Simeprevir in GT4

A) F0–F3 patients

- 8 weeks:
  - SVR4: 75 (50.9, 91.3)
  - SVR12: 75 (50.9, 91.3)

- 12 weeks:
  - SVR4: 100* (83.2, 100.0)
  - SVR12: 100 (83.2, 100.0)

Historical control: 50%

B) F4 patients

- 12 weeks:
  - SVR4: 100 (85.2, 100.0)
  - SVR12: 100 (85.2, 100.0)

Historical control: 25%

*One patient was detectable at SVR4 timepoint but was undetectable when the sample was retested. This patient subsequently achieved SVR12.

Numbers in brackets indicate 95% confidence intervals.

Historical control is reported SVR of Peg-IFN/RBV dual therapy. 

12
HCV G4 the Egyptian Clinical Trials in AASLD meeting SF 2015

- Sof + RBV
- Sof + PI (Simeprevir)
- Sof + NS5A (Ravidasavir)
- PI(Paritaprevir) + NS5A(Ombitasvir)
Efficacy and Safety of Co-Formulated Ombitasvir/Paritaprevir/Ritonavir with Ribavirin in Adults with Chronic HCV Genotype 4 Infection in Egypt (AGATE-II)

Gamal Esmat¹, Wahid Doss², Roula B Qaqish³, Imam Waked⁴, Gamal Shiha⁵, Ayman Yosry², Mohamed Hassany², Jennifer King³, Carolyn Setze³, Rebecca Redman³, Niloufar Mobashery³

Affiliation(s): ¹Cairo University, Cairo, Egypt; ²National Hepatology & Tropical Medicine Research Institute, Cairo, Egypt; ³AbbVie Inc, North Chicago, Illinois, United States; ⁴National Liver Institute, Menoufiya, Egypt; ⁵Egyptian Liver Research Institute And Hospital (ELRIAH), Dakahliah, Egypt
Efficacy and Safety of Co-Formulated Ombitasvir/Paritaprevir/Ritonavir with Ribavirin in Adults with Chronic HCV Genotype 4 Infection in Egypt

SVR4, SVR12: sustained virologic response 4 and 12 weeks after treatment (mean ± 95% CL)

Esmat, et al. - AASLD, 2015, Ab. a
HCV G4 the Egyptian Clinical Trials in AASLD meeting SF 2015

- Sof + RBV
- Sof + PI (Simeprevir)
- Sof + NS5A (Ravidasavir)
- PI(Paritaprevir) + NS5A(Ombitasvir)
High Virologic Response Rate in Egyptian HCV-Genotype 4 Patients Treated with Ravidasvir (PPI-668) and Sofosbuvir: Results of a Large Multicenter Phase 3 Registrational Trial

- G. Esmat, M. El Raziky, T. Elbaz, M.M. Abouelkhair, H. Gamal El Deen, M.K. Ashour, Cairo University, Cairo, EGYPT; M. El Raziky, M.M. Abouelkhair, M.K. Ashour, Cairo Fatemic Hospital, Cairo, EGYPT; A. Gomaa, A. Sabry, I. Waked, National Liver Institute, Cairo, EGYPT; M. Abdel-Hamid, Minia University, Cairo, EGYPT; O. Nada, Ain Shams University, Cairo, EGYPT; S. Helmy, H. Abdel-Maguid, Pharco Pharmaceuticals, Alexandria, EGYPT; R. Colonno, N. Brown, E. Ruby, P. Vig, Presidio Pharmaceuticals, San Francisco, California, UNITED
Total patients enrolled = 300, all patients completed treatment evaluations as of the data cutoff for this report

High percentage of cirrhotic patients: 130/300 (43.3%)
Among the 170 non-cirrhotic patients enrolled, there were three early discontinuations unrelated to safety or efficacy failure, **WITH NO RELAPSES**

100% SVR12 in non-cirrhotic patients, excluding discontinuations.
Among the 130 cirrhotic patients enrolled, there were two premature discontinuations (one safety related) and 6 virologic relapses.

No relapses to date in the cirrhotic 16 week treatment cohort.

Per protocol evaluation results in 94% SVR12 in cirrhotic patients.
### SVR according to treatment duration and use of ribavirin

<table>
<thead>
<tr>
<th></th>
<th>SOF + DCV (n = 317)</th>
<th>SOF + DCV + RBV (n = 92)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12 weeks</td>
<td>24 weeks</td>
</tr>
<tr>
<td>SVR 4</td>
<td>46/54</td>
<td>250/263</td>
</tr>
<tr>
<td>N %</td>
<td>85,2</td>
<td>95,1</td>
</tr>
<tr>
<td>SVR 12</td>
<td>45/53</td>
<td>172/184</td>
</tr>
<tr>
<td>N %</td>
<td>84,9</td>
<td>93,4</td>
</tr>
<tr>
<td>SVR 4 in cirrhotic patients</td>
<td>26/34</td>
<td>203/216</td>
</tr>
<tr>
<td>N %</td>
<td>76,5</td>
<td>94,0</td>
</tr>
<tr>
<td>SVR 4 in non cirrhotic patients</td>
<td>20/20</td>
<td>47/47</td>
</tr>
<tr>
<td>N %</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>SVR 4 in naïve patients</td>
<td>27/31</td>
<td>47/53</td>
</tr>
<tr>
<td>N %</td>
<td>87,1</td>
<td>88,7</td>
</tr>
<tr>
<td>SVR 4 in treatment-experienced patients</td>
<td>19/23</td>
<td>203/210</td>
</tr>
<tr>
<td>N %</td>
<td>82,6</td>
<td>96,7</td>
</tr>
<tr>
<td>SVR 4 in PI failure</td>
<td>4/5</td>
<td>128/132</td>
</tr>
<tr>
<td>N %</td>
<td>80,0</td>
<td>97,0</td>
</tr>
<tr>
<td>SVR 4 in PR failure</td>
<td>15/18</td>
<td>75/78</td>
</tr>
<tr>
<td>N %</td>
<td>83,3</td>
<td>96,1</td>
</tr>
</tbody>
</table>
Baseline HCV NS5A resistance-associated variants do not impact SVR12 rates in non-cirrhotic and post-liver transplant patients with genotype 1 infection treated with daclatasvir and sofosbuvir with or without ribavirin for 12 weeks: An integrated analysis
An integrated safety analysis of daclatasvir + sofosbuvir, with or without ribavirin, in patients with chronic HCV infection

Conclusion:

- DCV+SOF±RBV is associated with low rates of safety events. The presence of GT3 infection, HIV/HCV coinfection, advanced cirrhosis, or post-transplant HCV recurrence has minimal impact on safety, suggesting that DCV+SOF±RBV is a safe and well-tolerated treatment for a broad range of patients with chronic HCV infection.
Improvement in liver disease parameters following treatment with daclatasvir + sofosbuvir and ribavirin in patients with chronic HCV infection and advanced cirrhosis

**Conclusions:** DCV+SOF+RBV treatment in patients with advanced cirrhosis achieved high SVR12 rates and improved clinical and biochemical indicators of liver disease.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Baseline</th>
<th>_cp_score_Baseline</th>
<th>_Baseline to PT12</th>
<th>_Baseline</th>
<th>5.6 (0.51)</th>
<th>_Baseline to PT12</th>
<th>_Baseline</th>
<th>8.0 (0.73)</th>
<th>_Baseline to PT12</th>
<th>_Baseline</th>
<th>11.0 (0.91)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FibroTest score</td>
<td>Baseline</td>
<td>0.796 (0.10)</td>
<td>_Baseline to PT12</td>
<td>-0.110 (-0.2, 0.0)</td>
<td>0.829 (0.15)</td>
<td>_Baseline to PT12</td>
<td>-0.046 (-0.1, 0.0)</td>
<td>0.838 (0.09)</td>
<td>_Baseline to PT12</td>
<td>-0.067 (-0.1, 0.0)</td>
<td></td>
</tr>
<tr>
<td>Albumin, g/dL</td>
<td>Baseline</td>
<td>3.64 (0.35)</td>
<td>_Baseline to PT12</td>
<td>0.44 (0.2, 0.7)</td>
<td>3.18 (0.46)</td>
<td>_Baseline to PT12</td>
<td>0.38 (0.2, 0.5)</td>
<td>2.53 (0.42)</td>
<td>_Baseline to PT12</td>
<td>0.24 (-0.2, 0.7)</td>
<td></td>
</tr>
<tr>
<td>Total bilirubin, mg/dL</td>
<td>Baseline</td>
<td>0.89 (0.37)</td>
<td>_Baseline to PT12</td>
<td>-0.02 (-0.2, 0.2)</td>
<td>1.73 (0.98)</td>
<td>_Baseline to PT12</td>
<td>-0.18 (-0.4, 0.1)</td>
<td>2.60 (1.07)</td>
<td>_Baseline to PT12</td>
<td>0.11 (-0.5, 0.8)</td>
<td></td>
</tr>
</tbody>
</table>

Baseline: mean (SD)

\_Baseline to PT12: mean change from baseline to posttreatment week 12 (95% CI)
What Happens Without Therapy?

4 years follow up of 2120 patients

- **F2**
  - Decompensation: 3.6%
  - HCC: 1%
  - Death: 4.9%

- **F3**
  - Decompensation: 10.1%
  - HCC: 2.7%
  - Death: 10.4%

- **F4**
  - Decompensation: 27.7%
  - HCC: 8.3%
  - Death: 23.7%

*Fried M, AASLD 2014
Saleem M AASLD 2014*
SVR is Associated with Lower Incidence of ESLD, HCC or Death

Results from the HALT-C Trial
526 Patients, 7.5 years FU

Morgan TR et al. Hepatology 2010;52:833-844
Opening of 23 national treatment centres, 2007-2013

Total number of patients treated with PEG-IFN (2007-2013): 350,000
Annual number of new patients treated: 45,000
Annual budget from the Ministry of Health: 90 million $
National Plan of Action: conclusions

- Increase policymakers’ commitment to supporting the policy change necessary to prevent viral hepatitis transmission.
- Educate healthcare workers to prevent transmission of viral hepatitis in Egypt.
- Increase public awareness of viral hepatitis prevention.
- Promote safe injection practices in the community.
- Annual treatment of 200-350,000 patients by DAA.
## Chronology of Treatment Protocols Implemented by the National Program

<table>
<thead>
<tr>
<th>Date</th>
<th>Implemented Protocol</th>
<th>Inclusion criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-2014</td>
<td>PegIFN-RBV</td>
<td>F1-F3 patients</td>
</tr>
<tr>
<td>October 2014-May</td>
<td>Sofosbuvir-PegIFN-RBV</td>
<td>F3,F4 IFN tolerant</td>
</tr>
<tr>
<td>May 2015-November</td>
<td>Sofosbuvir-RBV</td>
<td>F3,F4 IFN intolerant up to Child B 8 (down to 7)</td>
</tr>
<tr>
<td>May 2015-November</td>
<td>Sofosbuvir-PegIFN-RBV</td>
<td>F0-F4, normal synthetic function</td>
</tr>
<tr>
<td></td>
<td>Sofosbuvir-Simeprevir</td>
<td>F0-F4, impaired synthetic function up to Child A6</td>
</tr>
<tr>
<td>November 2015</td>
<td>IFN-free regimen. Two DAAs ± RBV</td>
<td>F0-F4, impaired synthetic function up to B7. Higher Child in special centers</td>
</tr>
</tbody>
</table>
Before DAAs Era

IFN therapy (IFN/RBV) Non Cirrhotics

Week 48 PCR results

- Positive PCR 949
- Negative PCR 2286

ETR 71%

Week 72 PCR results

- Negative PCR 949
- Positive PCR 270
- Negative PCR 2016

SVR 62%

Relapser 270

SVR 2016

Week 48 N=3235
Triple therapy (IFN/SOF/RBV) 35% Cirrhotics

Week 12 PCR results

- Positive PCR 188
- Negative PCR 4394

NR 188
RS 4394

ETR
96%

SVR
92%

Week 24 PCR results

- Negative PCR 4197
- Positive PCR 197

Relapser 197

N=4582

Positive PCR 188

Till Nov 2015
till November 2015

Dual therapy (SOF/RBV) 70% Cirrhotics

Week 24 PCR results

ETR

98%

SVR

72%

Week 36 PCR results

Positive PCR

2627

43

Negative PCR

2584

NR 43

Positive PCR

696

Relapser 696

Negative PCR

1888

SVR 1888

RS 2584

NR 43

Positive PCR

696

Negotiate PCR

2584
C-EDGE TN: Efficacy Results

Subgroup analysis: significantly lower SVR12 rates in pts with baseline HCV RNA >
- No differences according to race, *IL28B* status, presence of cirrhosis

Future Therapy>2016

- Elbasvir+ Grazoprevir  MSD
- Sofo +GS 5816(Velpatasvir)  Gilead
- Sem+Nuc .PI+NS5A inh  Jansen
- Gene therapy mRNA
Egypt was chosen to host World Hepatitis Day 2015 as the country has demonstrated a high level of commitment by tackling hepatitis comprehensively in their plan of action for prevention, care and treatment.

The Ministry of Health has set up 32 specialized centres and introduced a new hepatitis C drug last year, which is the first highly-effective and approved direct-acting antiviral drug for the nationwide treatment of hepatitis C infection. This medication is safer than previous medications and has been shown to cure more than 90% of those completing treatment, in combination with other drugs. In a global first, the drug has been made available to Egyptian patients for US$ 900, which is 1% of its international price. So far, 128 000 people have started the new treatment.
Conclusion

- We are looking to say Goodbye Interferon. (PegIFN no longer recommended for first-line therapy of any patient)

- The ideal drug for treatment of HCV will be soon within our reach.
  (oral, short duration, SVR >90%, minimal side effects and affordable)

- The ideal drug has an important role in prevention.
THANK YOU
please visit

www.gamalesmat.com

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