Assessing the Risk of Transmission of Hepatitis C in an Egyptian Hospital

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Context:

Hepatitis C virus (HCV) causes hepatitis and can lead to long term liver disease. Today, Egypt has the highest prevalence of HCV in the world. Currently, there is no vaccine nor post-exposure prophylaxis. Health care workers (HCWs) are highly exposed to HCV patients and injuries that increase risk of blood-borne pathogen transmission. It is suspected that transmission within health care settings goes unnoticed or infection control might be lacking.

Objective:

To perform a risk assessment of HCV acquisition for patients within Ain Sham University Hospitals (ASUHs). And to identify high-risk patient profiles and hotspots within the hospitals, to propose control measures and reduce the transmission.

Methods:

A meta-analysis of existing data in the literature was used to compute risk of HCV transmission by different invasive procedures observed in the IMMHoTHep data. The HCV prevalence in ASUHs was calculated using the patient trajectory data and blood test results. The trajectory data, risks of the invasive procedures, and HCV prevalence were used to determine the individual risk of HCV acquisition for each patient. The individual risks were further used to analyze patient profile. Lastly, the invasive procedure data and HCV prevalence were used to determine the hotspots for HCV transmission risk.

Procedures	Pooled ORs	Correction factor	Transmission risk (%)	Sensitivity analysis	
				1%	9.2%
Endoscopy	1.743	0.785	1.727	0.785	7.223
Endotracheal intubation	1.743	0.785	1.727	0.785	7.223
Hemodialysis	1.927	0.868	1.910	0.868	7.986
Injection (REF)	**2.22**	**1.000**	**2.200**	**1.000**	**9.200**
Blood glucose			2.200	1.000	9.200
Stitches	2.323	1.046	2.302	1.046	9.627
Blood sample			2.500	1.136	10.455
IV catheter	2.89	1.302	2.864	1.302	11.977
Blood transfusion	3.445	1.552	3.414	1.552	14.277
Drainage catheter	3.612	1.627	3.579	1.627	14.969
Cardiac catheter	4.1	1.847	4.063	1.847	16.991
Gastric lavage	7	3.153	6.937	3.153	29.009
Wound dressing	10.1	4.550	10.010	4.550	41.856

Table 1: Risk of HCV transmission for each invasive procedure

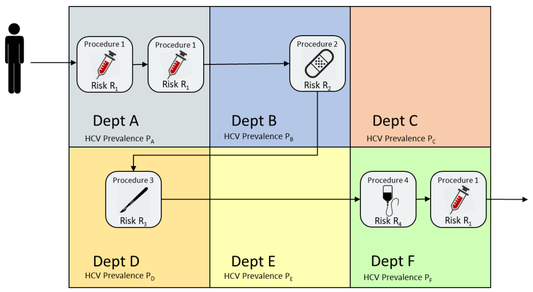
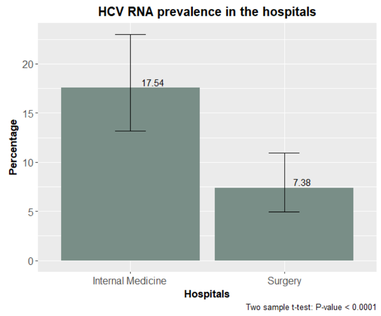


Figure 1: Method of risk assessment for each patient

$$\boldsymbol{R} = 1 - (1 - \boldsymbol{R_1} * \boldsymbol{P_A})^2 * (1 - \boldsymbol{R_2} * \boldsymbol{P_B}) * (1 - \boldsymbol{R_3} * \boldsymbol{P_D}) * (1 - \boldsymbol{R_4} * \boldsymbol{P_F}) * (1 - \boldsymbol{R_1} * \boldsymbol{P_F})$$

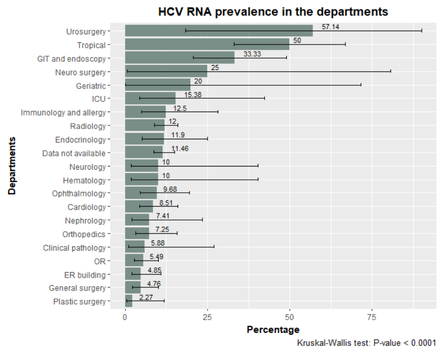
Results:

1. Prevalence

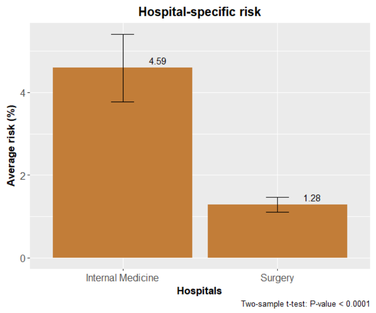


The HCV prevalence was found to be higher in internal medicine (17.54%; 95CI: 13.16 – 23.01%) than in surgery hospitals (7.38%; 95CI: 4.93 – 10.92%).

The department with the highest HCV prevalence was urosurgery (57.1%; 95CI: 18.41 – 90.10%).

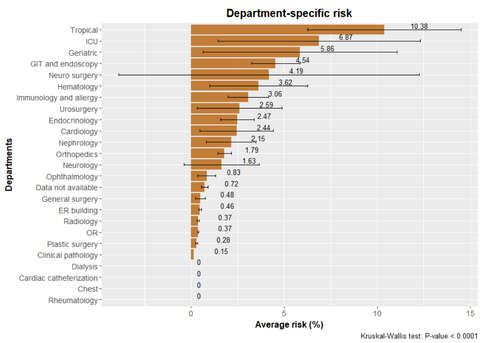


2. Hotspot (high-risk locations)



High risk patients were those in internal medicine, 4.65% (95CI: 3.75 – 5.55%),

The three department with the highest HCV transmission risk were tropical medicine (10:38%; 95CI: 6.25 – 14.51%; sensitivity analysis: 5.08 – 32.22%), ICU (6.87%; 95CI: 1.42 – 12.31%; sensitivity analysis: 3.26 – 22.64%), and geriatrics (5.86%; 95CI: 0.06 – 11.06%; sensitivity analysis: 2.74 – 20.87%).



3. High-risk Patient Profile

Risk increases with increase age

Risk increases with increase in duration of stay

Dialysis departments has the highest average risk patients (46.45%; 95CI: 25.20 – 67.70%).

No significant impact of sex

No significant impact of modes of admission

Conclusion:

Infection control precautions should be taken within these hotspots and healthcare workers be notified of patients with high-risk profiles. Based on these results, the decision makers at ASUHs can implement new protocols and policies that will aid in reducing HCV transmission at this major hospital in the capital of Egypt.

Infection Control

Acknowledgement:

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References:

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