MORBIDITY AND MORTALITY AMONGST INDIAN HAJJ PILGRIMS: A 3-YEAR EXPERIENCE OF INDIAN HAJJ MEDICAL MISSION IN MASS GATHERING MEDICINE

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INTRODUCTION: HAJJ

- Hajj exemplifies one of the world's largest peaceful mass-gatherings of 3.5 million pilgrims from 200 countries
- Challenges – Global health security, food, water, housing, transportation, crowd-control in desert-climate of Middle-East
- Low resource mass gathering set up – High morbidity and mortality, overwhelming patient surge, limited healthcare accessibility, difficult evacuation, language/communication
- Indian Hajj Medical Mission (IHMM) – Health security to 150,000 Indian pilgrims, foreign pilgrims and local residents
- Echeloned healthcare - 144 doctors, 146 paramedics

MATERIALS AND METHODS

- Ambispective, observational, outcome surveillance study
- Mecca, Medina and Jeddah in Saudi Arabia
- Mission posture – Holistic health security (Health, disaster, epidemic intelligence, preparedness and response
- IHMM established, operated and coordinated a strategic network of round-the-clock medical operations with a patient-centric mobile and deployable healthcare delivery model
- Primary care- 57 Static/tent clinics, mobile med task forces
- 4-9000 sheltered & 1.4 million unsheltered pilgrims/clinic
- 03 secondary care IHMM hospitals, evacuation capabilities
- Trauma, critical care, internal medicine, gynaecology, orthopaedics, general surgery, lab- medicine, radiology
- Onward referral to secondary/tertiary care Saudi hospitals
- Real-time surveillance and emergency response systems

RESULTS

- Doctor: Patient :: 1:944, Paramedic: Patient :: 1:931
- 4lakh patients annually: 57% males, 43% females
- Throughput/surge capacities overwhelmed

- Average medical usage rate – Thrice/pilgrim in 45 days
- 1^0 care Indian clinics – 392,000 patients/yr, 93% low acuity
- Pre-existing comorbidities lead to higher morbidity
- 53% infections - Respiratory and gastrointestinal common
- Cardiorespiratory, urogenital, trauma and heat stroke seen
- Outbreak of food poisoning – Managed and controlled
- Poor patient compliance to medical and preventive advice
- Analgesic abuse and self medication was common
- Colle's fracture (45%) due to fall on escalators, washroom
- 2^0 care Indian hosp –1000 patients, 75% hospitalized for pneumonia, bronchitis, diabetes, COPD, FUO, dehydration
- Bed days 2106, mean occupancy 78%, mean stay 3.6 days
- 2016 Surgeries -2275, investigations -7456, imaging -2074
- Aggressive therapy, antimicrobials – Culture unavailable
- 11 in-flight oxygen air-evac from Mecca to India
- All cause mortality – 11.99/10000 (2016), 27/10000 (2015)
- Occupational hazards - 90% healthcare personnel reported Respiratory infections

IMMH primary-care morbidity analysis during Hajj

	Year	2016	%age	2015	%age
1	Infectious disease	209856	53.26	220755	54.87
2	Orthopaedics/musculoskeletal	96151	24.4	99624	24.76
3	Cardiovascular disease	18314	4.64	16528	4.11
4	Respiratory Diseases	18621	4.73	12456	3.10
5	Urogenital/Gynaecological dis	1260	0.32	1521	0.38
6	Neurological/psychiatric disease	297	0.07	271	0.07
7	Gastrointestinal disease	4456	1.13	4186	1.04
8	Skin diseases	2243	0.57	2682	0.67
9	General Surgery	20567	5.22	24598	6.11
10	Eye diseases	358	0.09	234	0.06
11	ENT diseases	245	0.06	130	0.03
12	Dental disorders	60	0.01	65	0.02
13	Unclassified	4355	1.11	4990	1.24
	Total outpatients	**394013**	-	**402296**	-

IMMH secondary/tertiary care morbidity analysis during Hajj

		Secondary-Care Hospitalizations				Tertiary-Care Referrals			
	Morbidity	2016	%age	2015	%age	2016	%age	2015	%age
1	Cardiovascular Disease	28	4.79	26	3.82	134	27.10	109	17.10
2	Neuro/psychiatric dis	20	3.42	24	3.52	27	5.45	18	2.83
3	Gastrointestinal disease	171	29.20	180	26.40	57	11.50	76	11.90
4	Renal Disease	18	3.08	15	2.20	38	7.68	42	6.60
5	Respiratory Diseases	122	20.90	108	15.90	60	12.10	71	11.20
6	Endocrine disorders	63	10.80	50	7.34	26	5.25	31	4.87
7	Dehydration & Shock	6	1.03	5	0.73	6	1.21	12	1.89
8	Fever (Investigations)	52	8.89	60	8.81	12	2.42	17	2.67
9	General Surgery	64	10.90	117	17.20	52	10.50	93	14.60
10	Orthopaedics & Trauma	41	7.01	96	14.10	83	16.80	167	26.30
	Hospitalizations/Referral	585	-	681	-	495	-	636	-

DISCUSSION AND CONCLUSION

- Hajj 2016 was a success – No major disasters/crisis
- Operational stringencies- Low doctor: patient and ambulance: patient ratio (1:9300) affected interoperability
- Robust 24x7 mission posture along Hajj assemblage
- Overcrowding – 9people/m^2 - Crisis at ingress/egress
- High threat of Ebola, MERS, Rift Valley fever, Alkhumra etc
- Global health challenges – Outbreaks/epidemics/pandemic
- Geriatric patients – Low reserves – Hajj better at young age
- Stress induced physical, mental and compassion fatigue in healthcare personnel
- Mobile teams divert critical resources away from hospitals
- Early patient transfer to definitive care - Better outcome
- Clientele education/capacity building required for self-care
- Hajj health risk modelling to enhance resilience capital
- Telemedicine networks and decision-support systems

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