Risk Factors for Herpes Zoster: a Systematic Review and Meta-Analysis

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Accessibility
Turkey, 2Department of Infectious Diseases and Clinical Microbiology, Recep Tayyip Erdogan University, Rize, Turkey, 3Department of Infectious Diseases and Clinical Microbiology, Amasya University Sabuncuoglu Serefeddin Training and Research Hospital, Amasya, Turkey, 4Department of Medical Biochemistry, Karadeniz Technical University, Faculty of Medicine, Trabzon, Turkey

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Background. Crimean–Congo hemorrhagic fever (CCHF) is a potentially fatal disease caused by a tick-borne virus from the Bunyaviridae family. Cytokines play an important role in the pathogenesis of viral, bacterial, and immunologic diseases. This study aimed to investigate the role of TNF-alpha, IL-6, IL-10, and IFN-gamma levels in the severity of infection and clinical outcome of patients with CCHF.

Methods. Patients with confirmed CCHF were divided into two groups (severe cases: Patients who exhibited hemorrhage during their hospital stay, and mild/moderate cases: Patients who displayed no hemorrhage during their hospital stay). Demographic characteristics, laboratory tests on admission of all patients with CCHF were investigated, and serum TNF-alpha, IL-6, IL-10, and IFN-gamma levels were measured.

Results. A total of 154 patients with confirmed CCHF were investigated. Forty-six (29.9%) of these patients were in the severe group. In patients with severe CCHF, significantly higher serum levels of TNF-alpha (68.2 ± 23.5; P = 0.008) and IL-6 (73.1 ± 41.6; P = 0.003) were detected, compared with cytokine levels in patients who had mild/moderate CCHF (Table 1). No differences in serum IL-10 and IFN-gamma levels between patients who severe CCHF and those who had mild/moderate CCHF were detected (P = 0.05).

Table 1: Cytokine levels, demographic and laboratory characteristics in patients with severe and mild/moderate cases with CCHF.

<table>
<thead>
<tr>
<th>Features</th>
<th>Severe cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 46</td>
</tr>
<tr>
<td>Age (yr)</td>
<td>50.0 ± 20.3</td>
</tr>
<tr>
<td>Female gender,</td>
<td></td>
</tr>
<tr>
<td>n (%)</td>
<td>31 (67.4)</td>
</tr>
<tr>
<td>TNF-α (pg/ml)</td>
<td>68.2 ± 23.5</td>
</tr>
<tr>
<td>IL-6 (pg/ml)</td>
<td>73.1 ± 41.6</td>
</tr>
<tr>
<td>IL-10 (pg/ml)</td>
<td>6.2 ± 1.3</td>
</tr>
<tr>
<td>IFN-gamma (pg/ml)</td>
<td>145 ± 96</td>
</tr>
<tr>
<td>WBC (10^3/μl)</td>
<td>3786 ± 6.502</td>
</tr>
<tr>
<td>PLT (10^3/μl)</td>
<td>53,564 ± 36,520</td>
</tr>
<tr>
<td>CRP (mg/l)</td>
<td>3.2 ± 2.6</td>
</tr>
<tr>
<td>ALT (U/l)</td>
<td>521 ± 482</td>
</tr>
<tr>
<td>AST (U/l)</td>
<td>809 ± 1,182</td>
</tr>
<tr>
<td>CK (U/l)</td>
<td>1,138 ± 970</td>
</tr>
<tr>
<td>LDH (U/l)</td>
<td>1,800 ± 1,254</td>
</tr>
</tbody>
</table>

Conclusions. Cytokines, chemokines, and other inflammatory mediators function in a manner, acting on many different cell types to regulate the host's immune response. When cytokines present in high concentrations, they might toxic or even lethal effects. In accordance with this view, we have detected increased serum TNF-alpha, IL-6 levels in the patients with severe CCHF.

Disclosures. All authors: No reported disclosures.

1034. Etiologic Involvement of Enterovirus and Human Bocavirus in Acute Flaccid Paralytic Cases in India

Manjari Baluni, Ph.D(Pursuing); Dharmaveer Singh, Ph.D(Pursuing); Sneha Ghildiyal, PhD(Pursuing); Tapan Phole, MD; 1Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow, India, 2Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, India, 3Microbiology, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow, India

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Background. In India, acute flaccid paralysis (AFP), characterized by the rapid onset of flaccid paralysis, is one of the commonest presentation of viral neuroinfections, which are caused by a number of viruses like enterovirus, poliovirus, enteric adenovirus, coxsackievirus and echovirus. Human Bocavirus (HBoV) was recently classified member of the Parvoviridae family, has been detected frequently in a variety of clinical specimens. Onset of illness is rapid, and usually children present with flaccid paralysis which may result in permanent neurological sequelae. HBoV is a small non-enveloped virus comprising more than 100 serotypes that are detected in a variety of clinical specimens. HBoV infection may result in wide range of clinical syndromes, including acute respiratory infections, acute gastroenteritis, and neurological disorders. The objective of our study is to investigate the role of HBoV infection in paralytic cases presenting to the Institute.

Methods. A total of 86 transgender (Hijras) sex workers were randomly included in this study. Demographics, including age, the number of sex partners, sexual habits, and awareness about protective methods were obtained. Blood was collected from all subjects and the presence of Human Immunodeficiency Virus, Hepatitis B and C virus were determined by antibody strip testing. EBV detection and genotyping were performed by extracting genomic DNA from all available blood samples. B-globin and EBNA-1 were amplified to assess the quality and presence of EB DNA. Analysis of EBNA-2 genotyping was done by nested PCR.

Conclusions. EBV-1 was the most common genotype of EBV in HIV seropositive and seronegative TSW's but the high occurrence of EBV-2 and co-infection of both types was observed only in HIV seropositive individuals. This is the first report of frequency of EBV infections in the HIV positive transgender community of India.

Disclosures. All authors: No reported disclosures.

1036. Risk Factors for Herpes Zoster: a Systematic Review and Meta-Analysis

Kosuke Kawai, ScD; and Barbara P. Yawn, MD, MSc, MSPH, FAAFP; 1Boston Children’s Hospital and Harvard Medical School, Boston, Massachusetts; 2Department of Research, Olmsted Medical Center, Rochester, Minnesota; 3University of Minnesota, Minneapolis, Minnesota

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Background. Well-recognized risk factors for herpetic zoster (HZ), commonly known as shingles, are age and immunosuppression. Numerous studies have investigated other various risk factors for HZ in recent years. The objective of our study is to systematically review studies examining risk factors for HZ and discuss implications based on the updated evidence.

Methods. We performed a literature search using PubMed, Embase, and Web of Science and included studies that examined risk factors for HZ. Random effects model was used to summarize the risk ratio (RR) or odds ratio (OR) and 95% confidence interval (CI).

Results. Of the 3450 studies screened, we included 84 studies in the systematic review and conducted meta-analysis in 62 studies. Women are at increased risk of HZ compared with men (pooled adjusted RR = 1.31; 95% CI: 1.27, 1.34). Black individuals have almost half the risk of HZ than White individuals (pooled RR = 0.54; 95% CI: 0.47, 0.63). Family history was found to be a risk factor for HZ (pooled OR = 3.39; 95% CI: 2.39, 5.40). Autoimmune diseases, including rheumatoid arthritis (pooled RR = 1.67; 95% CI: 1.41, 1.98) and systemic lupus erythematosus (RR = 2.10; 95% CI: 1.40, 3.15), were associated with an elevated risk of HZ. Other comorbidities were associated with an increased risk of HZ, with the pooled ORs ranging from 1.25 (95% CI: 1.13, 1.39) for asthma to 1.30 (1.17, 1.45) for diabetes mellitus, and 1.31 (95% CI: 1.22, 1.41) for chronic obstructive pulmonary disease. Statin use was also
associated with a modest increased risk of HZ (pooled RR = 1.14; 95% CI: 1.11, 1.17). Recent physical trauma increased risk of HZ by almost two-fold (pooled RR = 2.56; 95% CI: 1.97, 3.33).

Conclusion. In addition to age and immunocompromised conditions, our review shows that female sex, race/ethnicity, family history, and comorbidities are risk factors for HZ. Efforts are needed to better understand risk factors and to increase the uptake of zoster vaccination.

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1037. Herpes–Zoster Infection in a Tertiary Hospital in Brazil
Luciana Antoniolli, Medical student; Aline Azambuja, MD, PhD; Camila Rodrigues, Medical student; Rafael Borges, medical student and Luciano Goldani, PhD, MD, MS; 1 Federal University of Rio Grande do Sul, Porto Alegre, Brazil, Infectious Diseases, Federal University of Rio Grande do Sul, Porto Alegre, Brazil, Internal Medicine, Infectious Diseases Unit, Hospital de Clinicas de Porto Alegre, Porto Alegre, Brazil

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Background. Herpes zoster (HZ) is a common infection with potential complications requiring hospital care, especially for patients with multiple comorbidities. However, there is little information on HZ from hospital registries.

Methods. We searched for hospital-based records of ICD-10 codes between March 2000 and January 2017 at Hospital de Clinicas de Porto Alegre, a tertiary, university hospital in south Brazil. To avoid misclassifications, we considered clinical evaluation for the diagnosis of cutaneous HZ and postherpetic neuralgia (PHN), ophthalmo logic evaluation for opthalmic HZ and the combination of clinical, radiologic and cerebrospinal fluid analysis for HZ meningo-encephalitis (ME). We analyzed conditions associated with immune dysregulation, complications, length of hospital stay, and mortality. Chi square test and Kaplan-Meier estimator were used for statistical analyses.

Results. There were 847 records for this period, of which 801 were confirmed according to our criteria and included in the analysis. Most patients were women (n = 448, 60%), with an average of 48.8 years, standard deviation of 22.2. There were more diagnoses in the inpatients group (74.4%), and fewer in the emergency room (22.4%). The median length of hospital stay was 7 days (2-10, P25-P75) when HZ was the main reason for admission. Most patients presented cutaneous HZ (n = 743, 92.8%). There were fewer cases of PHN (6.1%), opthalmic HZ (7.6%) and ME (4.1%). Seventy percent had some kind of immune dysregulation; more frequently AIDS (31%), use of immunosuppressive agents (18.7%) and malignant disease (16.2%). We followed the subjects for a median of 28.2 (2.8-77.5) months. During this period, there were 105 (13.1%) deaths. Five were related to HZ ME. The 30-day overall mortality rate was 1.5%. There was no statistical difference in cumulative survival (graph 1, P = 0.05) or incidence of complicated forms for patients with or without immune dysregulation.

Conclusion. Our sample was characterized by a majority of inpatient diagnoses. The 30-day mortality rate was lower than reported in similar studies, but there was a relevant impact of complicated forms in mortality and sequelae.

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May Elsherif, MD; Todd Hatchette, MD FRCP, C; Jason Loblanc, PhD; Lingyun Ye, MSC; Melissa K Andrew, MD, PhD; Arthid Ambrose, RN; Guy Boivin, MD, MS; William R. Bowie, MD, FRCP, FIDSA; Karen Green, MSc, RN; Kevin Kata, MD, CM, MSc; FRCP; Mark Loeb, MD, MSc; Donna MacKinnon-Cameron, MMath; Anne McCrathy, MD, MSc; Janet McElhaney, MD; Allison McGeer, MD, MSc; Michaela Nichols, MSc; Jeff Powis, MD, MSc, FRCP; David Richardson, MD, MSc; Makeda Semret, MD; Daniel Smyth, MD, FRCP; Sylvia Trottier, MD, PhD; Linda Valiquette, MD, MSc, FRCP; PM; Dumbarton White, MD; and Shelly McNeil, MD, FRCP, FIDSA; 1 Canadian Center for Vaccinology, IWK Health Centre and Nova Scotia Health Authority, Dalhousie University, Halifax, NS, Canada, 2 Nova Scotia Health Authority, Dalhousie University, Halifax, NS, Canada, 3 Centre Hospitalier Universitaire de Quebec, Quebec City, QC, Canada, 14 Division of Infectious Diseases, Department of Medicine, University of British Columbia, Vancouver, BC, Canada, 15 Mount Sinai Hospital, Toronto, ON, Canada, 16 York General Hospital, Toronto, ON, Canada, 17 McMaster University, Hamilton, ON, Canada, 18 The Ottawa Hospital, Ottawa, ON, Canada, 19 Health Sciences North Research Institute, Sudbury, ON, Canada, 20 Michael Garron Hospital, Toronto, ON, Canada, 21 William Oder Health System, Brampton, ON, Canada, 22 McGill University, Montreal, QC, Canada, 23 The Moncton Hospital, Moncton, NB, Canada, 24 Microbiology and Infectious Disease, Université de Sherbrooke, Sherbrooke, QC, Canada, 25 Saint John Regional Hospital, Dalhousie University, Saint John, NB, Canada

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Background. Influenza virus activity varies seasonally and within season. Epidemiology of serious influenza outcomes is contingent on the prevalent circulating strain/s and susceptible age group/s. Given the strain variability over the past 10 years in Canada, we aimed to identify the clinical and epidemiological profiles of different influenza strains causing adult hospitalizations.

Methods. During these three influenza seasons, the Serious Outcomes Surveillance (SOS) Network of the Canadian Immunization Research Network (CIRN) enrolled adults hospitalized with acute respiratory illness across Canada. Nasopharyngeal swabs (NPSs) from influenza cases were tested for strain characterization using real-time reverse transcriptase polymerase chain reaction (rtRT-PCR). A primary assay determined B influenza viruses. Subsequently, influenza A viruses were subtype as H1N1 or H3N2, and influenza B lineages were differentiated as Victoria or Yamagata. Laboratory results were compared with patient demographic data and clinical outcomes.

Results. Over three consecutive influenza seasons, 3394 cases of hospitalized acute respiratory illness were laboratory-confirmed as influenza. At 74.2%, influenza A was predominant across all seasons, while influenza B caused 27.6%. Most of the influenza A cases were due to H3N2 (58.7%), while H1N1 accounted for 41.3%. For influenza B, the Yamagata lineage dominated at 88.4% whereas the Victoria lineage accounted for 11.6%. Outcome analyses are presented for each influenza A subtype and influenza B lineage, overall and per season. Considering serious outcomes in patients ≥65, higher proportions of patients hospitalized with the H1N1 strain experienced intensive care unit (ICU) admission and need for mechanical ventilation, while higher proportions of patients hospitalized with B/Yamagata and H3N2 died within 30 days of admission.

Conclusion. Comprehensive collection of surveillance data paired with NP specimens by the CIRN SOS Network was conducive to broader understanding of influenza strain activity and associated outcomes at the subtype and lineage level. This data is important to make informed recommendations for the use of multicomponent influenza vaccines.