Canada
Weekly Diseases
Update

INFLUENZA SURVEILLANCE - CANADA
Number of Confirmations: From 6 October 1986 to 6 February 1987, inclusively, there have been 426 laboratory-confirmed influenza cases (420A and 6B) reported. These numbers indicate that, to date this season, there has been average influenza activity.

All specimens, whether confirmed by isolation or serological methods, were found to be A (H1N1), with the exception of one A (H3N2) isolate from a 3-year-old female from Dartmouth, Nova Scotia. The significance of this one A (H3N2) case, which was reported at the end of the second week of January with probable onset date of illness several weeks earlier, is not yet determined.

A breakdown of the A19A confirmations (excluding the single A (H3N2)) is as follows: 179 A (H1N1) (123 by isolation and 56 by seroconversion) and 240 A not-subtyped (31 by isolation and 209 by seroconversion). It is most probable that all these originally reported "not-subtyped A isolates" have now been identified as A (H1N1).

Initially, laboratories did not have immediate access to the required diagnostic reagents to subtype the first reported A isolates. Moreover, several laboratories have had difficulty growing A virus in eggs in order to perform hemagglutination inhibition (HI) testing. However, by February 1987, the negative findings of HI testing were confirmed by amantadine therapy.

Ages Affected: The majority of the reported influenza A infections occurred in those < 35 years of age which is consistent with the expectation that most older people would have been exposed to A (H1N1) prior to 1957, and

CONTAINED IN THIS ISSUE:
- Influenza Surveillance - Canada
- The Emergence of Novel A/Taiwan/1/86-Like Influenza Viruses From Western Canada That May Have Arisen By Genetic Reassortment

CONTENU DU PRÉSENT NUMÉRO:
- Surveillance de la grippe - Canada
- Nouveaux virus grippaux pseudo-A/Taiwan/1/86 provenant de l'Ouest canadien et pouvant résulter d'un rassortiment génétique

Update

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as early as 1917. The young are more likely to be tested for influenza infections than are older people, particularly the very elderly. However, these laboratory data are in agreement with current epidemiological reports from other countries which show that so far this season very few older and elderly people have had influenza-like illness or any attributed to A (H1N1). It is possible that some older people may have had subclinical illness due to partial protection derived from infection in earlier years.

Influenza A (H1N1) in Older People: As discussed above, A (H1N1) appears to mainly affect those <35 years of age. Nevertheless, since influenza is generally considered to lead to more serious consequences in the elderly, particularly in the presence of underlying disease, it is important to assess the impact of the A/Taiwan/1/86 (H1N1) strain in this population.

Griffe A (H1N1) chez les moins jeunes: Tel que mentionné plus haut, la gripe A (H1N1) semble avoir touché surtout les moins de 35 ans. Néanmoins, comme on considère généralement que la grippe a des conséquences plus graves chez les personnes âgées, particulièrement en présence d'une atteinte sous-jacente, il importe d'évaluer l'impact de la souche A/Taiwan/1/86 chez cette population.

Table 1. Canadian Laboratory Confirmations of Influenza A and Population by Age Group/Group d'Age.

<table>
<thead>
<tr>
<th>Age Group/ Groupe d'Age</th>
<th>A (H1N1)</th>
<th>A Not-Subtyped/ A non sous-typé</th>
<th>A Total</th>
<th>B Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 35</td>
<td>98</td>
<td>35 132</td>
<td>35 157 192</td>
<td>133 192 375</td>
</tr>
<tr>
<td>35-64</td>
<td>7</td>
<td>10 17</td>
<td>1 18 19</td>
<td>8 28 36</td>
</tr>
<tr>
<td>65+</td>
<td>1</td>
<td>1 2</td>
<td>1 0 9</td>
<td>2 9 11</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>49 157</td>
<td>37 106 223</td>
<td>145 235 380</td>
</tr>
</tbody>
</table>

Table 2. Epidemiological Information on 34 Influenza A (H1N1) Cases Over 50 Years of Age.

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Age</th>
<th>Sex</th>
<th>Location</th>
<th>Underlying Disease</th>
<th>Other Underlying Disease</th>
<th>Symptom/Endocrine</th>
<th>Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>55</td>
<td>M</td>
<td>Fort Nelson, B.C./N.B.</td>
<td>Myalgia, fever, chills</td>
<td>Myalgia, fever, chills</td>
<td>Gallbladder</td>
<td>Ceftriaxone</td>
</tr>
<tr>
<td>2.</td>
<td>50</td>
<td>M</td>
<td>Calgary, Alta./Alb.</td>
<td>Typical influenza-like</td>
<td>Pseudo-grippe  typhique</td>
<td>Hypertension</td>
<td>Atenolol</td>
</tr>
<tr>
<td>3.</td>
<td>51</td>
<td>F</td>
<td>Calgary, Alta./Alb.</td>
<td>Upper Respiratory</td>
<td>Tract Infection/SIRS/</td>
<td>Infection des voies aérodigestives supérieures (IVAS)</td>
<td>Steroids</td>
</tr>
<tr>
<td>4.</td>
<td>73</td>
<td>M</td>
<td>Saskatoon, Sask.</td>
<td>Influenza-like/</td>
<td>Pseudo-grippe</td>
<td>Myalgia, lymphnodes,</td>
<td>Penicillin</td>
</tr>
<tr>
<td>5.</td>
<td>65</td>
<td>F</td>
<td>Kelviniton, Sask.</td>
<td>Typical influenza-like</td>
<td>Pseudo-grippe  typhique</td>
<td>Myalgia, swelling</td>
<td>Doxycycline</td>
</tr>
<tr>
<td>6.</td>
<td>64</td>
<td>M</td>
<td>Windermere, Ont.</td>
<td>Influenza-like/</td>
<td>Pseudo-grippe</td>
<td>Myalgia, pneumonia</td>
<td>Erythromycin</td>
</tr>
<tr>
<td>7.</td>
<td>69</td>
<td>F</td>
<td>Toronto, Ont.</td>
<td>Influenza-like/</td>
<td>Pseudo-grippe</td>
<td>Pneumonia</td>
<td>Bronchodilator,</td>
</tr>
<tr>
<td>8.</td>
<td>60</td>
<td>M</td>
<td>Timmins, Ont.</td>
<td>FEVER, U&amp;LRTI/</td>
<td>Fièvre, IVAS et plus</td>
<td>Asthme, Asthme</td>
<td>Prednisone</td>
</tr>
<tr>
<td>9.</td>
<td>59</td>
<td>M</td>
<td>Yellowknife, N.T.</td>
<td>Influenza-like/</td>
<td>Pseudo-grippe</td>
<td>Lesions, uréémie</td>
<td>Chemotherapy</td>
</tr>
<tr>
<td>10.</td>
<td>93</td>
<td>F</td>
<td>Yellowknife, N.T.</td>
<td>Influenza-like/</td>
<td>Pseudo-grippe</td>
<td>Nécessité d'hospitalisation</td>
<td>Amantadine</td>
</tr>
</tbody>
</table>

N.B. Case 10-11 had received the seasonal vaccine last fall. The 8 cases marked with an asterisk were confirmed by laboratories after notification. Les 8 cas recensés avec un astérisque ont été confirmés par laboratoire après notification.
In an earlier issue(2), results of HI testing of human sera for the prevalence of influenza A (H1N1) antibodies were shown for different age groups based on a minimum titre of 1:40. For those >65, the results showed that the percentage of individuals having antibodies to A/Chile/1/83 (H1N1) and A/Taiwan/1/86 was 46 and 38, respectively. However, if these results are expressed using a minimum titre of 1:20, then the percentages increase to 69 and 58, respectively. The latter suggests that a very large percentage of people over age 65 still have some immunity to A (H1N1). Minimum titre values of 1:20 have been considered protective in studies done elsewhere(3) to express immune status to A (H1N1). The difficulties in relating serological data to immune status are known(4,5).

Because of the interest in A (H1N1) infection in the older population, detailed information was obtained on 14 of the 19 cases that occurred in those over 50. This information is summarized in Table 2. The details provided for these 14 cases show 2 common features - almost all had had a medical problem in these cases. It should also be noted that specimen collecting from high-risk individuals probably more susceptible to infections. It should also be noted that specimen collecting from high-risk individuals may be less than from others because of greater medical interest to minimize further aggravation to existing medical problems in these cases.

Acknowledgements: The collaboration of the Provincial Epidemiologists, Laboratory Directors, hospital staff, and medical practitioners is appreciated.

References:

SOURCE: Eily Bollegraaf, Disease Surveillance Division, Bureau of Communicable Disease Epidemiology, LCDC, Ottawa, Ontario.

THE EMERGENCE OF NOVEL A/TAIWAN/1/86-LIKE INFLUENZA VIRUSES FROM WESTERN CANADA THAT MAY HAVE ARisen BY GENETIC REASSORTMENT

Genetic variants of A/Taiwan/1/86-like (H1N1) influenza viruses have been isolated in Canada suggesting that intensive examination of circulating strains is now warranted.

Since the beginning of the 1986-87 influenza season, regional public health laboratories have sent 20 influenza isolates to the Isolate Section, LCDC, for reference analysis. Sixteen of the 20 tested so far have been serologically A/Taiwan/1/86-like.

The first influenza isolate was received from Dr. R.D. Devine, Provincial Public Health Laboratory, Edmonton, Alberta on 16 December 1986, and had been collected on 25 November 1986 from a 31-year-old female with pneumonia who was undergoing cyclophosphamide treatment for complications arising from systemic lupus erythematosus (E. Bollegraaf, Bureau of Communicable Disease Epidemiology: personal communication, 1987). Although this virus was serologically indistinguishable from A/Taiwan/1/86, it was the first isolate sent for analysis this influenza season and was, therefore, subjected to molecular analysis to determine its overall genetic relationship with prototype A/Taiwan/1/86. This Alberta isolate was found to be very different from the prototype strain by T1 oligonucleotide fingerprinting of genomic RNA, polyacrylamide gel electrophoresis of genomic RNA, and SDS PAGE of viral proteins. These findings strongly suggest that this isolate contains non-H1N1 genes obtained through genetic reassortment. The fact that this isolate is antigenically identical to the circulating virus by hemagglutination inhibition assay would indicate that it possesses the same H1 gene and probably the same N1 gene. The molecular biological

Un numéro antérieur(2) faisait état des résultats de l'épreuve HI pratiquée sur des séums humains pour déterminer la prévalence des anticorps anti-A (H1N1) pour divers groupes d'âge et en regard d'un titre minimal de 1:40. Chez les plus de 65 ans, les pourcentages respectifs de sujets présentant des anticorps anti-A/Chile/1/83 (H1N1) et anti-A/Taiwan/1/86 étaient de 46 et de 38. Toutefois, si ces résultats sont exprimés en fonction d'un titre minimal de 1:20, les pourcentages grimpent respectivement à 69 et 58. Ce dernier pourcentage donne à penser qu'une très grande proportion de plus de 65 ans ont encore un certain degré d'immunité à l'égard du virus A (H1N1). Dans des études étrangères(3) visant à établir l'immunité à A (H1N1), on a jugé peu des titres minimaux de 1:20 conféraient une protection. On n'ignorait rien de la difficulté de relier des données sérologiques au statut immunologique(4,5).

Étant donné l'intérêt de l'infection à A (H1N1) chez la population plus âgée, des données détaillées ont été obtenues pour 14 des 19 cas survenus chez des plus de 50 ans. Le tableau 2 présente le résumé. Cet examen a mis en évidence que tous les sujets visés présentaient d'autres états pathologiques graves et faisaient l'objet d'une médication à long terme. Les immunodéprimés étaient probablement plus réceptifs aux infections. Il convient également de souligner que le prélèvement d'échantillons est peut-être plus fréquent chez des sujets à haut risque. En effet, il a été démontré que, sur le plan médical, il est plus important dans de tels cas de restreindre toute aggravation à des problèmes existants.

Remerciements: Nous tenons à remercier de leur collaboration les épidémiologistes provinciaux, les directeurs de laboratoire, le personnel hospitalier, et les médecins-praticiens.

Références:

SOURCE: Eily Bollegraaf, Division de la surveillance des maladies, Bureau de l'épidémiologie des maladies transmissibles, LCCM, Ottawa (Ontario).

NOUVEAUX VIRUS GRIPPAUX PSEUDO-A/TAIWAN/1/86 PROVENANT DE L'OUEST CANADIEN ET POUVANT RÉSULTER D'UN REASSORTIMENT GÉNÉTIQUE

Des variantes génétiques de virus grippe similaires à A/Taiwan/1/86 (H1N1) ont été isolées au Canada, ce qui laisse entendre qu'il faut maintenant procéder à l'examen intensif des souches en circulation.

Depuis le début de la saison grippe 1986-1987, 20 isolats grippe ont été envoyés à des fins d'analyse de référence à la Section des maladies grippales du LCCM par des laboratoires régionaux de santé publique. Les 16 qui ont été analysés se sont révélés sérologiquement analogues à A/Taiwan/1/86.

Le premier isolat grillé a été reçue le 16 décembre 1986; envoyé par le DR D. Devine (Laboratoire provincial de santé publique, Edmonton (Alberta)), il provenait d'un prélèvement pratiqué le 25 novembre 1986 chez une femme de 31 ans atteinte de pneumonie et traitée avec de la cyclophosphamide pour un lupus érythémateux disséminé à complications (E. Bollegraaf, Bureau de l'épidémiologie des maladies transmissibles, communication personnelle, 1987). Quoique sérologiquement analogue à A/Taiwan/1/86, le virus en question a fait l'objet d'une analyse moléculaire visant à déterminer quels étaient ses liens génétiques globaux avec la souche prototype, car il s'agissait du premier isolat de la présente saison grillée à être présenté à des fins d'analyses. On a établi qu'il différait vraiment de la souche prototype, par les techniques suivantes: patron génétique de restriction T1 des oligonucléotides du génome ARN, électrophorèse en gel de polyacrylamide (PAGE) du génome ARN, et PAGE en présence de SDS des protéines virales. Ces résultats donnent fortement à penser que l'isolat contient des gènes non H1N1 obtenus par réassortiment génétique. Le fait que l'isolat s'est révélé, par inhibition de l'hémagglutination, identique au virus prototype sur le plan antigénique indiquerait qu'il possède le même gène H1 et probablement le même gène N1 que le prototype. D'après les analyses de...
analyses suggest that most of the genes of internal proteins have been exchanged from another influenza subtype. Two other influenza isolates that had been collected in early December 1986 from 2 young females (7 and 13 years old) were received from Drs. T. Izumi, Department of Public Health, Regina, Saskatchewan. Both viruses appeared to be the same as the Alberta strain by T1 oligonucleotide fingerprinting, SDS PAGE of protein, and electro-erosion of RNA. T1 oligonucleotide mapping of an Ottawa isolate, collected on September 1986, and submitted by Dr. E. Rossier, Regional Virology Laboratory, Children's Hospital of Eastern Ontario, revealed that it was like conventional non-reassortment A/Taiwan/1/86. All of the variant A/Taiwan/1/86 strains were very distinct from A/Chile/1/83 by the same analyses. As an aside, a large degree of dissimilarity was seen between A/Chile/1/83 and A/Taiwan/1/86 by T1 mapping suggesting that the latter did not evolve from the former and is consistent with the weak cross reactivity observable by hemagglutination inhibition assay. Molecular analysis of other strains is ongoing. Future work will not only involve the detailed molecular analysis of the genome of the suspected reassortants but will also involve surveillance of the epidemic potential of these unusual influenza isolates.

In the past, reassortants have arisen between H1N1 and H3N2 strains. Reassortants of A/USSR/90/77 and A/Brazil/11/78 occurred in 1978 and were responsible for the majority of epidemic influenza in North America and parts of Asia in 1979. The reassortant type A/Brazil/11/78 strains were replaced by the non-reassortant type A/Brazil/11/78 strains in 1980 and thereafter(1).

The occurrence of these suspected A/Taiwan/1/86-like reassortants is not cause for alarm at the present, since they are antigenically indistinguishable from the prototype, and thus, should have no greater advantage with respect to the immune status of the population than prototype A/Taiwan/1/86. Likewise, the current A/Taiwan/1/86 variant described will be effective against any reassortant bearing the A/Taiwan/1/86 hemagglutinin. However, this does not preclude the fact that a novel reassortant will have a greater epidemic potential or an altered virulence. Given that the molecular genetic basis for influenza pathogenicity is largely unknown(2,3), it is presently not possible to predict disease or epidemic potential from viral structure or properties(4). (The elucidation of the molecular genetic basis of influenza pathogenesis is one of the current goals of the Influenza Section at LCDC.) Since this novel form of A/Taiwan/1/86 is of unknown epidemic or disease potential, it is important that physicians and diagnostic laboratory personnel report any apparent increases in disease prevalence or changes in clinical symptoms of disease to their local or regional public health officials.

References

SOURCE: EG Brown, PhD, Research Scientist, Influenza Section, Viral Diagnostic Services Division, LCDC, Ottawa, Ontario.

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