

Influenza as Research Trend among Iranians: 2016-2017

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1.

- Molecular characterization and phylogenetic analysis of human influenza A viruses isolated in Iran during the 2014-2015 season.

Arch Virol. 2017 Jul;162(7):1975-1984. doi:
10.1007/s00705-017-3323-3.

Molecular characterization and phylogenetic analysis of human influenza A viruses isolated in Iran during the 2014-2015 season.

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1.

- Here, we sought to genetically characterize influenza A/H1N1pdm09 and A/H3N2 viruses collected in Iran during the 2014-2015 influenza season.
- A total of 200 nasopharyngeal swabs were collected from patients with influenza-like illnesses.
- Swabs were screened for influenza A and B using real-time PCR.
- Furthermore, positive specimens with high virus load underwent virus isolation and genetic characterization of their hemagglutinin (HA) and M genes.

1.

- Of the 200 specimens, 80 were influenza A-positive, including 44 A/H1N1pdm09 and 36 A/H3N2, while 18 were influenza B-positive.
- Phylogenetic analysis of the HA genes of the A/H1N1pdm09 viruses revealed the circulation of clade 6C, characterized by amino acid substitutions D97N, V234I and K283E.
- Analysis of the A/H3N2 viruses showed a genetic drift from the vaccine strain A/Texas/50/2012 with 5 mutations (T128A, R142G, N145S, P198S and S219F) belonging to the antigenic sites A, B, and D of the HA protein.
- The A/H3N2 viruses belonged to phylogenetic clades 3C.2 and 3C.3. The M gene trees of the Iranian A/H1N1pdm09 and A/H3N2 mirrored the clustering patterns of their corresponding HA trees.

1.

- Our results reveal **co-circulation of several influenza A virus strains in Iran during the 2014-2015 influenza season.**

2.

- Seasonal influenza A/H3N2 virus infection and IL-1B, IL-10, IL-17, and IL-28 polymorphisms in Iranian population.
- *J Med Virol.* 2016 Dec;88(12):2078-2084. doi: 10.1002/jmv.24572.

Seasonal influenza A/H3N2 virus infection and IL-1B, IL-10, IL-17, and IL-28 polymorphisms in Iranian population.

Rogo LD^{1,2}, Rezaei F^{3,4}, Marashi SM¹, Yekaninejad MS⁵, Naseri M^{1,6}, Ghavami N^{1,6}, Mokhtari-Azad T^{7,8}.

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2.

- This is a Case-Control study in which influenza A/H3N2 virus positive confirmed with real-time PCR were the cases.
- DNA samples from groups were genotyped for polymorphisms in rs16944 (IL-1 β), rs1800872 (IL-10), rs2275913 (IL-17), and rs8099917 (IL-28).
- Confidence interval (95%CI) and Odds ratio (OR) were calculated.

2.

- IL-17 rs2275913 (GG and AG) were associated with risk of infection with that were statistically significant ($P < 0.05$, OR = 2.08-2.94).
- IL-1 β (rs16944) (GG) was associated with reduced risk of infection ($P < 0.01$, OR = 0.46).
- Genotype GG and GT of IL-10 (rs1800872) were associated with increased risk of infection with influenza A/H3N2 virus ($P < 0.05$, OR = 2.04-2.58).

2.

- In addition, IL-28 (rs8099917) genotypes GG ($P < 0.05$, OR = 0.49) and TG ($P < 0.05$, OR = 0.59) were associated with reduced risk of ILI symptom while genotype TT ($P < 0.01$, OR = 4.31) was associated with increased risk of ILI symptom.

2.

- The results of this study demonstrated that polymorphisms of genes involved in the inflammatory and anti-inflammatory process affect the outcome of disease caused by influenza A/H3N2 virus.
- Thorough insight on host immune response at the time of influenza A virus infection is required to ensure adequate patient care in the case of future outbreaks.

3.

- Serological evidence of H9N2 avian influenza virus exposure among poultry workers from Fars province of Iran.

Viol J. 2016 Jan 27;13:16. doi: 10.1186/s12985-016-0472-z.

Serological evidence of H9N2 avian influenza virus exposure among poultry workers from Fars province of Iran.

Heidari A^{1,2}, Mancin M³, Nili H⁴, Pourghanbari GH^{5,6}, Lankarani KB⁷, Leardini S⁸, Cattoli G⁹, Monne I¹⁰, Piccirillo A¹¹.

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- 1 Research and Innovation Department, Istituto Zooprofilattico Sperimentale delle Venezie, OIE/FAO and National Reference Laboratory for Newcastle Disease and Avian Influenza, OIE collaborating Center for Diseases at the Human-Animal Interface, Viale dell'Università 10, Legnaro, PD, 35020, Italy. Ali.h.biotec@gmail.com.
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- 11 Department of Comparative Biomedicine and Food Science, University of Padua, Legnaro, PD, Italy. alessandra.piccirillo@unipd.it.

3.

METHODS:

- 100 poultry workers and 100 healthy individuals with no professional exposure to poultry took part in this study. Serum samples were tested for antibodies against two distinct H9N2 avian influenza viruses, which showed different phylogenetic clustering and important molecular differences, such as at the amino acid (aa) position 226 (Q/L) (H3 numbering), using haemagglutination inhibition (HI) and microneutralization (MN) assays.

3.

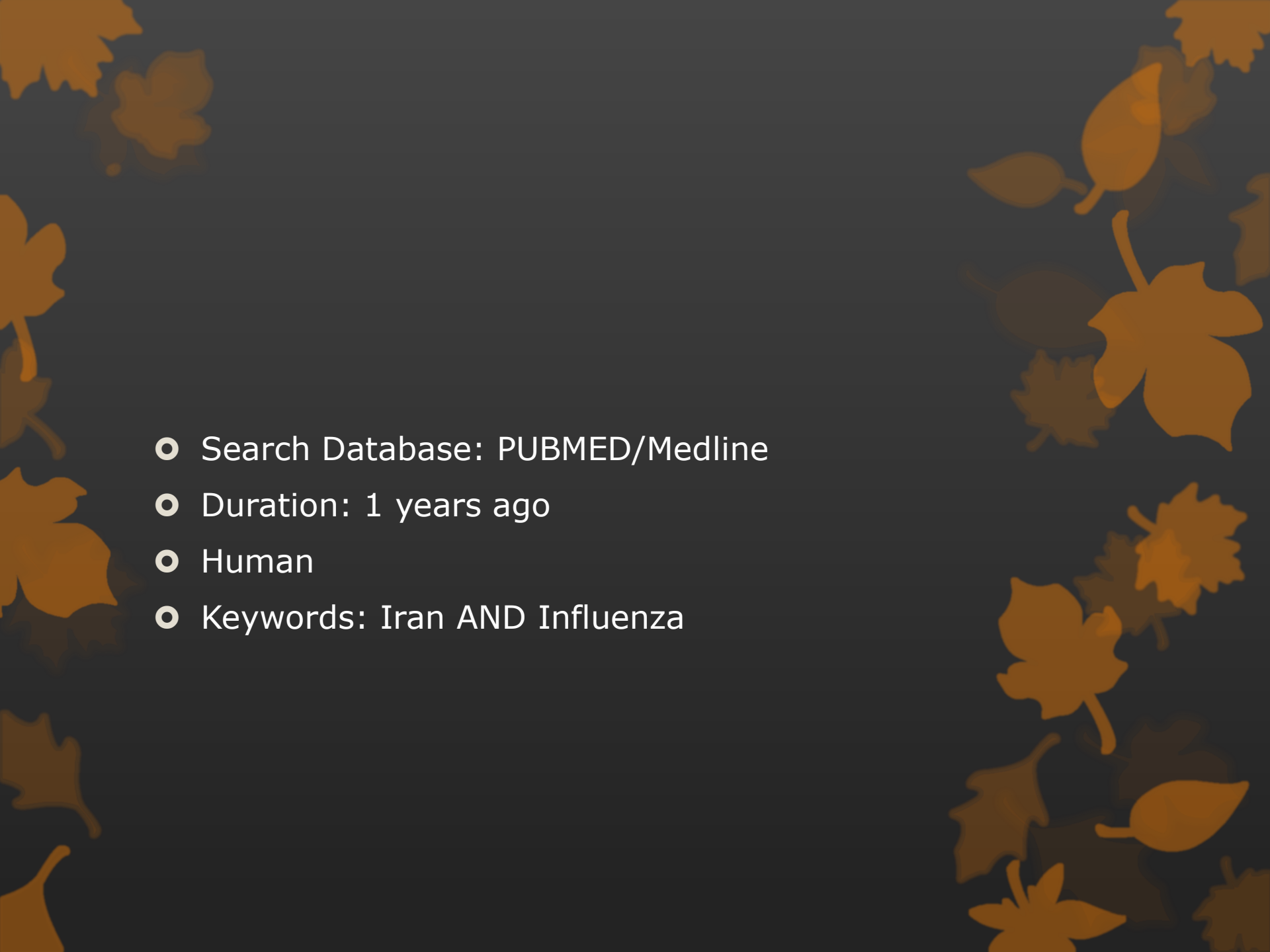
RESULTS:

- Results showed that 17 % of the poultry workers were positive for the A/chicken/Iran/10VIR/854-5/2008 virus in MN test and 12 % in HI test using the titer ≥ 40 as positive cut-off value.
- Only 2 % of the poultry workers were positive for the A/chicken/Iran/12VIR/9630/1998 virus.
- Seroprevalence of non exposed individuals for both H9N2 strains was below 3 % by both tests.
- Statistical analyses models showed that exposure to poultry significantly increases the risk of infection with H9N2 virus.

3.

CONCLUSIONS:

- The results have demonstrated that exposure to avian H9N2 viruses had occurred among poultry workers in the Fars province of Iran.
- Continuous surveillance programmes should be implemented to monitor the presence of avian influenza infections in humans and to evaluate their potential threat to poultry workers and public health.

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- Search Database: PUBMED/Medline
 - Duration: 1 years ago
 - Human
 - Keywords: Iran AND Influenza

Article types

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- We reviewed these records: only **20 abstracts** were associated with Humans, Clinical Studies, ...

- 1: Ayubi E, Safiri S. **The association between red cell distribution width and poor outcomes in hospitalized patients with influenza: Methodological issues.** J Crit Care. 2017 Jul 8. pii: S0883-9441(17)30962-0. doi: 10.1016/j.jcrc.2017.07.016. [Epub ahead of print] PubMed PMID: 28712651.
- 2: Moasser E, Behzadian F, Moattari A, Fotouhi F, Rahimi A, Zaraket H, Hosseini SY. **Molecular characterization and phylogenetic analysis of human influenza A viruses isolated in Iran during the 2014-2015 season.** Arch Virol. 2017 Jul;162(7):1975-1984. doi: 10.1007/s00705-017-3323-3. Epub 2017 Mar 22. PubMed PMID: 28331993.
- 3: Moghadami M. **A Narrative Review of Influenza: A Seasonal and Pandemic Disease.** Iran J Med Sci. 2017 Jan;42(1):2-13. Review. PubMed PMID: 28293045; PubMed Central PMCID: PMC5337761.
- 4: Razavi SM, Saeednejad M, Salamati P. **Vaccination in Hajj: An Overview of the Recent Findings.** Int J Prev Med. 2016 Dec 15;7:129. doi: 10.4103/2008-7802.195826. eCollection 2016. Review. PubMed PMID: 28105294; PubMed Central PMCID: PMC5200976.


- 5: RahimiRad S, Alizadeh A, Alizadeh E, Hosseini SM. **The avian influenza H9N2 at avian-human interface: A possible risk for the future pandemics.** J Res Med Sci. 2016 Jul 29;21:51. doi: 10.4103/1735-1995.187253. eCollection 2016. Review. PubMed PMID: 28083072; PubMed Central PMCID: PMC5216463.
- 6: Jahangirifard A, Hossein Ahmadi Z, Golestani Eraghi M, Tabarsi P, Marjani M, Moniri A, Nadji SA, Hashemian SM, Velayati AA. **H1N1 Influenza Patient Saved by Extracorporeal Membrane Oxygenation: First Report from Iran.** J Tehran Heart Cent. 2016 Jul 6;11(3):153-156. PubMed PMID: 27956916; PubMed Central PMCID: PMC5148819.
- 7: Behzadi MA, Ziyaeyan M, Alborzi A. **A diagnostic one-step real-time reverse transcription polymerase chain reaction method for accurate detection of influenza virus type A.** Arch Med Sci. 2016 Dec 1;12(6):1286-1292. Epub 2016 Oct 24. PubMed PMID: 27904520; PubMed Central PMCID: PMC5108395.
- 8: Soroushzadeh SM, Khiveh A, Gerayelimalek V. **Role of Iranian Traditional Medicine in the Prevention of Respiratory Infectious Diseases.** Iran J Med Sci. 2016 May;41(3 Suppl):S56. PubMed PMID: 27840522; PubMed Central PMCID: PMC5103565.

- 9: Vazirian M, Faridfar S, Eftekhari M. "Gharikon"/"Agharikon" a Valuable Medicinal Mushroom in Iranian Traditional Medicine. Iran J Med Sci. 2016 May;41(3 Suppl):S34. PubMed PMID: 27840500; PubMed Central PMCID: PMC5103541.
- 10: Gouya M, Rezaei F, Haghdoost A, Nabavi M, Farahi KS, Mostafavi E, Azad TM, Akbari H, Soroush M, Riazi H, Bitaraf E, Dadras MN, Barati H, Shakoori H, Bathaei J, Rezvani M, Hemmati P. Estimation of influenza and severe acute respiratory illness incidence (burden) in three provinces of the Islamic Republic of Iran, 2012 and 2013. East Mediterr Health J. 2016 Oct 2;22(7):432-439. PubMed PMID: 27714736.
- 11: Mandil A, Bresee J, Tageldin MA, Azad TM, Khan W. Research agenda on persistent and unpredictable threat of influenza and emerging respiratory infections: a public health necessity in the Eastern Mediterranean Region. East Mediterr Health J. 2016 Oct 2;22(7):430-431. PubMed PMID: 27714735.
- 12: Fallah Ghalhari G, Mayvaneh F. Effect of Air Temperature and Universal Thermal Climate Index on Respiratory Diseases Mortality in Mashhad, Iran. Arch Iran Med. 2016 Sep;19(9):618-24. doi: 0161909/AIM.004. PubMed PMID: 27631176.

- 13: Bijani B, Pahlevan AA, Qasemi-Barqi R, Jahanihashemi H. **Metabolic syndrome as an independent risk factor of hypoxaemia in influenza A (H1N1) 2009 pandemic.** Infez Med. 2016 Jun 1;24(2):123-30. PubMed PMID: 27367322.
- 14: Pourghanbari G, Nili H, Moattari A, Mohammadi A, Iraji A. **Antiviral activity of the oseltamivir and Melissa officinalis L. essential oil against avian influenza A virus (H9N2).** Virusdisease. 2016 Jun;27(2):170-8. doi: 10.1007/s13337-016-0321-0. Epub 2016 May 21. PubMed PMID: 27366768; PubMed Central PMCID: PMC4908999.
- 15: Baghbanian SM. **Influenza vaccination in patients with multiple sclerosis is possible with some considerations.** Iran J Neurol. 2016 Apr 3;15(2):109-10. PubMed PMID: 27326369; PubMed Central PMCID: PMC4912669.
- 16: Rogo LD, Rezaei F, Marashi SM, Yekaninejad MS, Naseri M, Ghavami N, Mokhtari-Azad T. **Seasonal influenza A/H3N2 virus infection and IL-1B, IL-10, IL-17, and IL-28 polymorphisms in Iranian population.** J Med Virol. 2016 Dec;88(12):2078-2084. doi: 10.1002/jmv.24572. Epub 2016 Jul 27. PubMed PMID: 27155288.

- 17: Farzin H, Toroghi R, Haghparast A. **Up-Regulation of Pro-Inflammatory Cytokines and Chemokine Production in Avian Influenza H9N2 Virus-Infected Human Lung Epithelial Cell Line (A549)**. Immunol Invest. 2016;45(2):116-29. doi: 10.3109/08820139.2015.1099663. Epub 2016 Feb 5. PubMed PMID: 26849159.
- 18: Heidari A, Mancin M, Nili H, Pourghanbari GH, Lankarani KB, Leardini S, Cattoli G, Monne I, Piccirillo A. **Serological evidence of H9N2 avian influenza virus exposure among poultry workers from Fars province of Iran**. Virol J. 2016 Jan 27;13:16. doi: 10.1186/s12985-016-0472-z. PubMed PMID: 26817813; PubMed Central PMCID: PMC4728806.
- 19: Muthuri SG, Venkatesan S, Myles PR, ..., Khalili H, Khandaker G, ..., Lankarani KB, Zarogoulidis P; **PRIDE Consortium Investigators, Nguyen-Van-Tam JS. Impact of neuraminidase inhibitors on influenza A(H1N1)pdm09-related pneumonia: an individual participant data meta-analysis**. Influenza Other Respir Viruses. 2016 May;10(3):192-204. doi: 10.1111/irv.12363. Epub 2016 Feb 1. PubMed PMID: 26602067; PubMed Central PMCID: PMC4814862.
- 20: Bahramsoltani R, Sodagari HR, Farzaei MH, Abdolghaffari AH, Gooshe M, Rezaei N. **The preventive and therapeutic potential of natural polyphenols on influenza**. Expert Rev Anti Infect Ther. 2016;14(1):57-80. doi: 10.1586/14787210.2016.1120670. Epub 2015 Dec 7. Review. PubMed PMID: 26567957.

Now we review all relevant
clinical-epidemiologic abstracts:

The background of the slide is a dark grey color. It is decorated with numerous silhouettes of various types of leaves in a golden-brown or orange hue. These leaves are scattered across the page, with a higher concentration along the left and right edges, framing the central text. The leaves vary in shape, including some with distinct lobes and others that are more oval or pointed.

H1N1 Influenza Patient Saved by Extracorporeal Membrane Oxygenation: First Report from Iran.

- Herein, we describe **a patient** with H1N1 influenza and severe respiratory failure not **improved by mechanical ventilation who was admitted to Masih Daneshvari Medical Center in March 2015**. She was placed on ECMO, from which she was successfully weaned 9 days later. The patient was discharged from the hospital after 52 days. Follow-up till 11 months after discharge revealed completely active life with no problem. There should be a close collaboration among infectious disease specialists, cardiac anesthetists, cardiac surgeons, and intensivists for the correct timing of ECMO placement, subsequent weaning, and care of the patient. This team work was the key to our success story. This is the first patient to survive H1N1 with the use of ECMO in Iran.

A diagnostic one-step real-time reverse transcription polymerase chain reaction method for accurate detection of influenza virus type A.

RESULTS:

- The optimized assay results were similar to the WHO's. The optimized assay results were similar to WHO's, with non-significant differences for 10-103 copies of viral RNA/reaction ($p > 0.05$).
- It detected 10 copies of viral RNA/reaction with high reproducibility and no cross reactivity with other respiratory viruses. A specific cytopathic effect was observed in 6/64 (9.37%) of the ILI group using conventional culture and DFA staining methods; however, it was not seen in non-ILI. Also, the results of our assay and the WHO's were similar to those of viral isolation and DFA staining.

CONCLUSIONS:

- Given the high specificity, sensitivity and reproducibility of this novel assay, it can serve as a reliable diagnostic tool for the detection of influenza A viruses in clinical specimens and lab experiments.

Role of Iranian Traditional Medicine in the Prevention of Respiratory Infectious Diseases.

- RESULTS:

- The perspective of traditional medicine for the prevention of disease in "havae vabai" is based on self-recuperation and air modification. Items that are mentioned are; refine the surrounding air, move to a proper space, live in a house with no source of water like fountains and limited flow of air, air-drying, use air freshener, smell fruit sticks, use in-house plants, and place a cloth soaked with vinegar in front of the nose. For self-recuperation, reducing body moisture with proper foods and drugs or with vomiting, diarrhea, phlebotomy, wet-cupping, reduction in food and drink intake, avoiding sexual intercourse, bathing, heavy exercise, inactivity, overeating, hunger, thirst, milk, sweets, fish, fatty foods, fruits especially juicy fruits are recommended. The food that tends to have a sour taste, eating meat cooked with sour taste like vinegar is suggested.

- CONCLUSION:

- The use of the solutions offered in traditional medicine to control air is helpful as it can reduce epidemics, such as influenza; that yearly kills many patients with a heavy financial burden.

Estimation of influenza and severe acute respiratory illness incidence (burden) in three provinces of the Islamic Republic of Iran, 2012 and 2013.

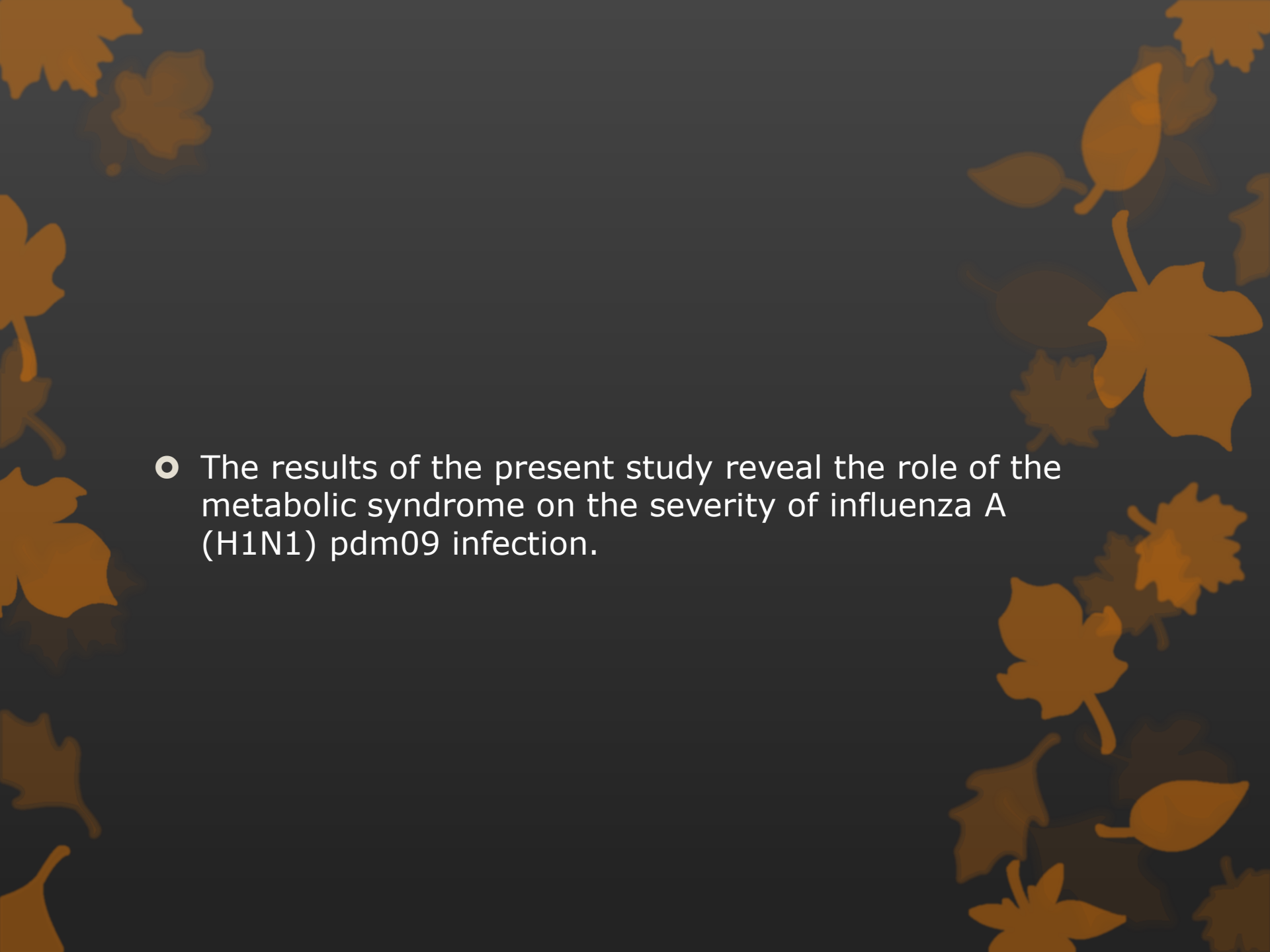
- In this study we estimated the burden of severe acute respiratory infection (SARI) and influenza-associated SARI (F-SARI) in selected provinces of Islamic Republic of Iran, the trends of SARI and confirmed cases of influenza (F-SARI) over 12 months (seasonality), and the age groups most at risk.

- Using the electronic Iranian influenza surveillance system and data of cases in sentinel hospitals of 3 selected provinces, we estimated the monthly trend (seasonality) of incidence for SARI and F-SARI, overall incidence of SARI and F-SARI and their disaggregation by age with the aid using the Monte Carlo technique. The age groups most at-risk were children aged under 2 years and adults older than 50 years.

Metabolic syndrome as an independent risk factor of hypoxaemia in influenza A (H1N1) 2009 pandemic.

- We investigated the association between the overweight, metabolic syndrome and the severity of disease in the confirmed cases in Qazvin province, Iran.
- The study sample included all patients over 12 years old with confirmed influenza A (H1N1) in the province of Qazvin, Iran, in the 2009 pandemic, excluding pregnant women.
- To define overweight, sex and age-specific body mass index (BMI) cutoffs recommended by the International Obesity Task Force were used.
- Metabolic syndrome was defined by ATP III criteria.
- Multiple logistic regression analysis was performed to identify statistically independent predictors of hypoxaemia.

- Out of 55 confirmed cases, 28 (50.9%) were overweight and 24 (45.3%) were identified as having metabolic syndrome by ATP III criteria.
- Twenty four patients had hypoxaemia (arterial oxygen saturation below 90%) during the course of the disease. In multivariate logistic regression analysis, pulmonary co-morbidity (OR=9.54; 95% CI, 1.36 to 66.88; p= 0.023) and the metabolic syndrome (OR=18.66; 95% CI, 1.60 to 217.47; p= 0.019) were revealed to be independent risk factors for hypoxaemia in influenza A (H1N1) pdm09.

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- The background of the slide is a dark grey color, decorated with various silhouettes of autumn leaves in shades of orange and brown. The leaves are scattered across the frame, with some appearing larger and more prominent than others. The overall aesthetic is clean and seasonal.
- The results of the present study reveal the role of the metabolic syndrome on the severity of influenza A (H1N1) pdm09 infection.

Antiviral activity of the oseltamivir and *Melissa officinalis* L. essential oil against avian influenza A virus (H9N2).


- The findings of the study showed that lemon balm essential oil could inhibit influenza virus replication through different replication cycle steps especially throughout the direct interaction with the virus particles.

Impact of neuraminidase inhibitors on influenza A(H1N1)pdm09-related pneumonia: an individual participant data meta-analysis.

- METHODS:
- A worldwide meta-analysis of individual participant data from 20 634 hospitalised patients with laboratory-confirmed A(H1N1)pdm09 (n = 20 021) or clinically diagnosed (n = 613) 'pandemic influenza'. The primary outcome was radiologically confirmed IRP. Odds ratios (OR) were estimated using generalised linear mixed modelling, adjusting for NAI treatment propensity, antibiotics and corticosteroids.

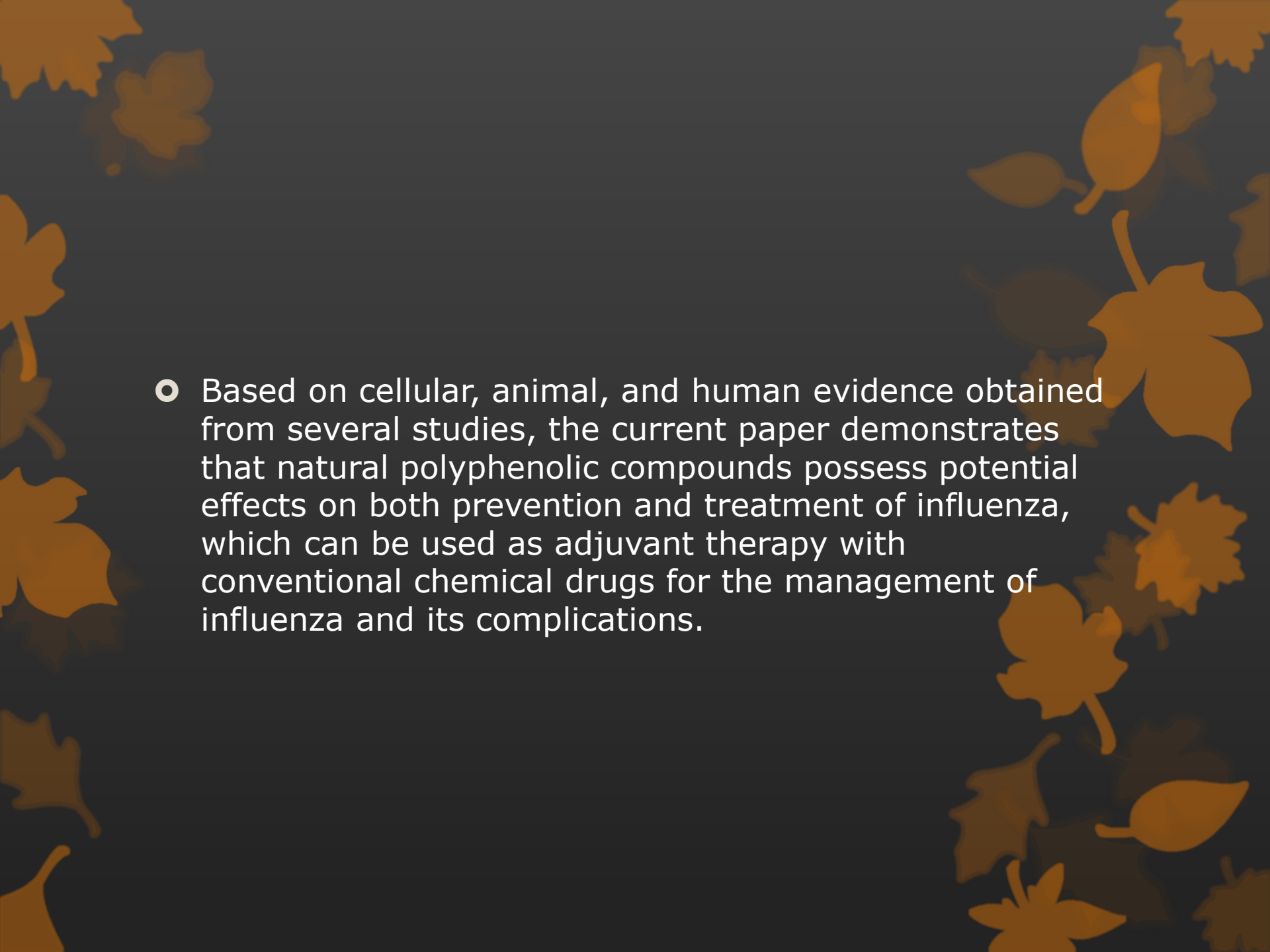
- RESULTS:

- Of 20 634 included participants, 5978 (29.0%) had IRP; conversely, 3349 (16.2%) had confirmed the absence of radiographic pneumonia (the comparator). Early NAI treatment (within 2 days of symptom onset) versus no NAI was not significantly associated with IRP [adj. OR 0.83 (95% CI 0.64-1.06; P = 0.136)]. Among the 5978 patients with IRP, early NAI treatment versus none did not impact on mortality [adj. OR = 0.72 (0.44-1.17; P = 0.180)] or likelihood of requiring ventilatory support [adj. OR = 1.17 (0.71-1.92; P = 0.537)], but early treatment versus later significantly reduced mortality [adj. OR = 0.70 (0.55-0.88; P = 0.003)] and likelihood of requiring ventilatory support [adj. OR = 0.68 (0.54-0.85; P = 0.001)].

- 
- CONCLUSIONS:
 - Early NAI treatment of patients hospitalised with A(H1N1)pdm09 virus infection versus no treatment did not reduce the likelihood of IRP. However, in patients who developed IRP, early NAI treatment versus later reduced the likelihood of mortality and needing ventilatory support.

The preventive and therapeutic potential of natural polyphenols on influenza.

- In this paper, a comprehensively **review** of natural polyphenolic products used worldwide for the management of influenza infection is presented.
- Cellular and molecular mechanisms of the natural polyphenols on influenza infection including suppressing virus replication cycle, viral hemagglutination, viral adhesion and penetration into the host cells, also intracellular transductional signaling pathways have been discussed in detail.

- 
- Based on cellular, animal, and human evidence obtained from several studies, the current paper demonstrates that natural polyphenolic compounds possess potential effects on both prevention and treatment of influenza, which can be used as adjuvant therapy with conventional chemical drugs for the management of influenza and its complications.

