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Hello I am doctor Jagdish Goyal from All India Institute of Medical Sciences Jodhpur. In next 8 to 10 minutes I will be speaking on transmission of SARS nCOV-2 infection.

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The outline of my presentation will be what are different mode of transmission of virus, incubation period, what is the period of infectivity, asymptomatic and pre-symptomatic transmission and at the end I will discuss about preventive strategies based on mode of transmission.

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Primary mode of Transmission as we all know is from infected person. Direct transmission occurs when person is in close contact, current policy of at least one metre physical distance which may lead to larger reduction of infection, however; two metres distance might be more effective as adopted by few countries. Transmission can also occur through direct inhalation of infected particles during coughing and sneezing, in form of droplet infection when particle size is more than 5 micrometre and in form of aerosol when particle size is less than 5 micrometre. Droplet rapidly falls into ground by force of gravity while aerosol evaporate and remains in air for hours. No definitive evidence of airborne transmission till date. However, there are concern regarding airborne transmission in few recent papers.

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Transmission can also occur through fomites when fomites are soiled by infected respiratory secretions. Virus may be viable on surface for few hours to few days. Experimental data use high viral load to study viability of virus on different surfaces. Virus may remain viable on plastic for 72 hours, on stainless steel for 48 hours, on cardboard for 24 hours and on copper for 4 hours. However, there is no robust data regarding Association of virus transmission and temperature and humidity.

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In this picture you can see how the virus spread through close contact, airborne transmission and how it spreads through fomites.

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Airborne transmission may occur with particle size less than 5 micrometre as they remain in the air for long period up to three hours. Transmission can occur more than one metre distance. Airborne transmission can also occur during an aerosol generating procedure. Information on risk of transmission is from speculative data during SARS outbreak. This was the study published in year 2012 and you can see the risk in different aerosol generating procedure.

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Virus is also detected in non-respiratory specimen. It may remain viable in stool for more than 30 days and in blood up to 14 days. There are few paper regarding presence of virus in ocular secretion and semen also.

Role of transmission of non-respiratory specimen remain uncertain. Faecal-oral route is not significant for transmission.

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Virus is also detected in blood. Risk of blood-borne transmission likely to be extremely low (through blood product and through needle stick injury). There is no evidence of transmission through contact with mucous membrane site.

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In this figure you can see the median incubation period of virus which is around 5 days. Most of the patient become symptomatic within 11 days.

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This figure shows the period of infectivity. Viral shedding occurs two to three days before appearance of symptoms. Infectivity declines significantly 8 days after symptom onset.

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There is a lot of debate regarding asymptomatic transmission. People who are infected but never develop symptoms are defined as asymptomatic transmission. Transmission from asymptomatic individual is difficult to study. Information are gathered from detailed contact tracing from few countries. Asymptomatic are less likely to transmit virus than those who develop symptoms. Risk of transmission in asymptomatic person is very low.

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Pre-symptomatic transmission is defined as people who infect other before they develop symptoms. Pre-symptomatic transmission has been studied in Singapore and it was found to happen in 6.4 % of cases. It occurs two to three days before appearance of symptoms and now modelling study suggest up to 44% of transmission occur before onset of symptoms.

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Transmission effectively occur in close contact and family members. Secondary attack rate among household contact was found to be 12.4%. Older individuals are more susceptible. Transmission usually occur during incubation period. Infectivity is more during incubation period than during symptomatic period.

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Based on mode of transmission there are various preventive strategies: case identification and isolation, quarantine of all close contacts, droplet precautions, airborne precaution during aerosol generating procedure, use of medical mask, practice of frequent hand hygiene and social distancing. Avoid crowded place, close contact setting and closed space. Use fabric mask in crowded place.

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To summarise primary source of SARS novel corona virus infection is from infected person, transmission of virus can also occur by close contact and droplet. Virus is also detected in non-respiratory secretion but role in transmission remain uncertain. Median incubation period of virus is 5 days. Asymptomatic and pre-symptomatic transmission can occur in close contact and family members. Emphasising preventive strategies is important to halt the progress of virus.

Slide 16: Thank you for your attention