**Epidemiologist Problem**

**1. An epidemiologist from Kidwai memorial hospital, Bangalore has conducted a cohort study in selected villages of Tumkur district regarding tobacco chewing and development of Carcinoma cheek. Total population studied = 800, 14 people developed Ca cheek after 5 yrs. Among the CA cheek cases 6 people had a history of tobacco chewing. Calculate the relative risk of developing CA, the attributable risk and the prevalence rate. Population with history of tobacco chewing = 250.**

**SOLUTION**

Total population of cohort = 800

No. of cases who developed CA cheek = 14

No. of people who did not develop CA cheek = 786

Among the 14 cases, 6 had history of tobacco chewing.

In the total population, 250 had history of tobacco chewing

Let us first create a 2 x 2 contingency table.

|  |  |  |  |
| --- | --- | --- | --- |
| h/o tobacco chewing | People who developed CA cheek | People who did not develop CA cheek | Total |
| Yes  No | 6(a) 8(c) | 244 (b) 542 (d) | 250 (a + b) 550 (c + d) |
| Total | 14(a + c) | 786 (b + d) | 800 (a + b + c + d) |

Calculation of relative risk

Relative risk = Incidence of disease among exposed

Incidence of disease among the non-exposed

RR = 6 / 250 = 6x550 = 3300 / 2000 = 1.65

8 / 550 8x250

The relative risk = 1.65

The risk of developing CA cheek is 1.65 times higher among tobacco chewers than among non-chewers

Calculation of attributable risk

Attributable risk =Incidence among exposed - Incidence among non-exposed

Incidence of disease among the exposed

Incidence among exposed = (6/250) x 100 = 2.40;

Incidence among the non-exposed = (8/550) x 100 =1.45

AR = (2.40 - 1.45) X 100 = 39.6 %

2.40

Therefore, 39.6% of the CA cheek among the tobacco chewers, was due to tobacco chewing.

Prevalence rate = PR =14 / 800x100 = 1.75%

The prevalence of CA cheek in the cohort was found to be 1.75%.

**2. In a case control study of 100 people, 50 were smokers out of which 30 developed coronary artery disease. Among non- smokers , 20 developed coronary artery disease. Calculate the odds ratio.**

**SOLUTION**

Total number people in the study = 100

Total number of smokers = 50

Number of people who developed CAD = 30

Let us first construct a 2 x 2 contingency table

|  |  |  |  |
| --- | --- | --- | --- |
| **Exposure** | **Cases (CAD)** | **Controls (No CAD)** |  |
| Smoking | 30(a) | 20(b) | 50 |
| No smoking | 20(c) | 30(d) | 50 |
|  | 50 | 50 | 100 |

Define Odds ratio

Odds ratio is defined as the cross product ratio. It is a measure of the strength of association between the suspected risk factor and an outcome. It is a key parameter in the analysis of the case control study.

OR = ad / bc = (30 x 30) / (20 x 20) = 900 / 400 =2.25

Interpretation: The odds of developing coronary vascular disease among smokers are 2.25 times more compared to non-smokers.

**3. The data relating to a case control study is given below . Calculate exposure rates and comment.**

**SOLUTION**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Case: Ca Lung** | **Control: No Ca Lung** | **Total** |
| Smokers | 33(a) | 42(b) | 75 (a + b) |
| Non-Smokers | 02(c) | 38(d) | 40 (c + d) |
| Total | 35 (a + c) | 80 (b + d) | 115 (a + b + c + d) |

Exposure rates

Cases: a / (a+c) x 100 = 33 / 35 x 100 = 94.29%

Controls: b / (b+d) x 100 = 42 / 80 x 100 = 52.50 %

Comment: The exposure rates show that the frequency rate of lung cancer was definitely higher among smokers as compared to non smokers.

OR = ad / bc = (33 x 38) / (42x2) = 1254/84 = 14.93

**4. The following table provides data regarding smokers and lung cancer. Calculate relative risk and attributable risk.**

**Solution**

|  |  |  |  |
| --- | --- | --- | --- |
| **Smoking** | **Developed Lung Ca** | **Did not develop Lung Ca** | **Total** |
| Yes | 70 | 6930 | 7000 |
| No | 03 | 2997 | 3000 |

Relative risk = Incidence among the exposed

Incidence among non exposed

70 / 7000= 70x3000= 10

3 / 3000 70000x3

Attributable risk = Incidence among exposed - Incidence among non-exposed

Incidence of disease among the exposed

(70 / 7000) – ( 3 / 3000) x100

70 / 7000

0.01-0.001xlOO = 0.9x100 =90%

90%

**5. A case control study was conducted to evaluate the interrelationship between several risk factors for myocardial infarction (Ml). Information on smoking was collected from a total of 1578 cases and controls. Current cigarette smoking, defined as smoking during past three months, was reported by 314 of the 732 cases and 220 of the 846 controls.**

**a. Set up appropriate 2x2 table**

**b. Calculate a measure of association between current smoking and Ml**

**c. What is the excess risk of Ml in cigarette smokers that is attributable to cigarette smoking?**

**d. Provide interpretation for your results**

**e. Write disadvantages of case control study.**

|  |  |  |  |
| --- | --- | --- | --- |
| **H/O smoking** | **Cases** | **Control** | **Total** |
| Present | 314(a) | 220(b) | 534 |
| Absent | 418 (c) | 626(d) | 1044 |
|  | 732 | 846 | 1578 |

**Solution**

- ODD's ratio = ad/bc = 314\*626/418\*220 = 196564/91960= 2.13

- In case control we cannot find attributable risk because incidence cannot be calculated in case control.

- ODD's of being exposed to smoking among cases is twice (2.13) times more compared to non-smokers

-Not good for rare exposures.

Doesn't give any idea of prevalence /incidence.

Temporal relationship is a matter of conjecture but no proof.

Prone for selection, information biases, survivorship bias, recall bias.

**6. 23 adults and 2 children had sudden vomiting and abdominal colic within 12 hour of consuming food at a marriage party. Describe the steps of investigation and control.**

**Solution:**

From the case history, it is evident that food poisoning has occurred which needs to be investigated.

**Investigation**

**Objectives**

*To know:*

*Type of food poisoning*

*Food items responsible*

*Source of poison*

*Mode of entry of poison/toxin into food*

*Offending organism/toxin.*

**Data collection**

*By visiting the place*

**A) Out break details:**

*Time—***When***did it occur?*

*Place—***Where***did it occur?*

*Person—***Who** *all were affected?*

*Cause—***Why** *has it occurred?*

*Mode—***How** *has it occurred?*

*Control—***What** *should be done?*

**B) Food consumption details**

*List of all persons who consumed food with their age and sex*

*Date and time of food consumption.*

*Food items consumed during the meal*

*Number of persons affected*

*Date and time of onset of symptoms (illness)*

*Time interval between food consumption and onset of illness (incubation period)*

*Food consumed during previous 72 hour, with time and place.*

**Treatment (if taken earlier) details**

*Diagnosis: Nature of treatment:*

**Clinical details of person affected**

*Name:*

*Age:*

*Sex:*

**Symptoms**

*Nausea Fever/chills Blurring of vision*

*Vomiting Abdominal cramps/discomfort Constipation*

*Retching Headache Difficulty in speaking*

*Prostration Dizziness Other.*

*Diarrhea Diplopia*

**Predominant symptom**

**Summary of epidemiological case histories**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Name of person who consumed the suspected food or drink** | **Date and time of food consumption** | **Food items actually consumed in the specified meal** | | | | **ill or**  **Not ill** | **Date and hour of onset of first symptom** | **Incubation period** | **Nausea/Vomiting** | **Diarrhea** | **Fever/Headache** | **Abdominal discomfort** | **Others** | **Lab investigations** |
|  |  | *A* | *B* | *C* | *D* |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Confirmation criteria of an outbreak:**

*Occurred following ingestion of common food*

*Suddenly affected a large number of persons*

*Similar manifestations in most of them*

**Finding the type of food poisoning: By studying the**

*Features of poisoning*

*Incubation period*

*Signs, symptoms*

*Lab report*

*By the process of exclusion—cholera, bacillary dysentery, arsenic poisoning.*

**Differentiation of food poisoning:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Causative Agent** | **Incubation period (in hour)** | **Symptoms** | **Food item** |
| *Staphylococcus aureus* | *< 6* | *Vomiting, abdominal pain* | *Milk, custard, fried rice, uncooked meat* |
| *Bacillus cereus* | *< 6* | *Emetic/diarrheal form, vomiting, abdominal pain* | *Fried rice, reheated food* |
| *Clostridium perfiringens* | *6–12* | *Abdominal pain, diarrhea* | *Cooked meat kept for long time* |
| *Salmonella* | *12–24* | *Fever and chills abdominal pain, diarrhea, vomiting* | *Meat, poultry, egg, dairy food, processed food* |
| *Clostridium botulinum* | *18–36* | *Dysphagia, diplopia, dysarthria, blurring of vision, motor weakness, consciousness is retained* | *Canned, preserved food and low acidic food* |

**Identification of responsible food item**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Food item** | **Group A**  **Persons who consumed specified food item** | | | | **Group B**  **Persons who did not consume specified food item** | | | |
|  | *ill* | *Not ill* | *Total* | *Attack rate (%)* | *ill* | *Not ill* | *Total* | *Attack rate (%)* |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

**Sanitary inspection of premises used for**

*Preparation*

*Storage*

*Consumption*

*Cleanliness of premises*

*Storage facility and quality*

*Fly, rodent and poultry proofing*

*Cleanliness of utensils and crockery used*

**Details about food used**

**Food items used Hygienic details**

*Raw items Washed thoroughly Yes/No*

*Fish/marine/meat/poultry Certification in slaughter house Yes/No*

*Custard, canned tinned Proper packing and storage time Yes/No*

*Milk Pasteurization Yes/No  
Other items*

**Cooking and serving**

*Method of preparation: Proper/Improper*

*Cooking: Adequate/Inadequate*

*Food covering: Proper/Improper*

*Prepared food kept at room temperature for longtime: Yes/No, if yes, how long*

*Reheating before consumption: Yes/No*

*Refrigeration (if done details):*

*Food served: With bare hand/spoons*

*Water served: Potable/Unpotable*

**Examination of food handlers and cook**

*Personal hygiene Respiratory infections*

*Hands, nails, hair hygiene Skin lesions, infections*

*Hand washing after toilet and before touching food ENT infections*

*Any acute illness—cough, sneeze, etc. Other clinical findings*

*Diarrhea Habits—smoking, pan chewing, spitting, putting fingers in mouth, nose, ear, hair*

**Laboratory examinations**

*Vomitus and stool samples—Aerobic and anaerobic culture*

*Food sample—Appearance, smell, chemical reaction, deviation from normal*

*Swabs from food handlers—Throat, nose, skin lesions, hands, rectum*

*Isolation of salmonella among food handlers in three successive stool culture to rule-out carrier state*

*Blood examination for antibodies—After 1 week*

*Animal experiment—Feeding/Animal inoculation*

**Summary of epidemiological case histories**

*Epidemiological analysis: Time/Place/Person*

*Confirmation of out break: Sudden rise and sudden fall in number of cases. No secondary cases*

*Epidemiological association: By case control study*

**Study of Morbidity**

**

**

**Association of exposure and outcome**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Food exposure** | **Number exposed to food** | **illness** | **No illness** | **Total** |
| *Yes* |  |  |  |  |
| *No* |  |  |  |  |

**Final Report**

**Control measures**

*Providing supportive treatment to sick*

*Relieving anxiety and reassurance of all concerned*

*Maintenance of food sanitation and kitchen hygiene*

*Infected food handlers should not be allowed to handle food items*

*Food handlers health examination*

*Observing the rules of hygiene including hygienic food handling*

*Health education regarding observing hygiene in selection, cooking, storage and serving.*

*Periodic training of food handlers*

*Continuing surveillance*

**Hygienic Food Handling and Storage**

*Minimize the use of hands in preparation and serving*

*Refrigeration of food item in a clean condition*

*No spoilt food is placed in refrigerator*

*Cook the food for sufficient time and temperature high enough to destroy the bacteria*

*Do not keep the food exposed for long time after cooking, if the food is to be consumed later, it should be cooled and then put in the refrigerator (< 4 ºc)*

*Refrigerated food should be reheated before consumption*

*Food stuffs like custard—canned food, bakery products should be reheated in an oven over 200 °C before consumption.*

*Areas used for food storage, cooking and serving should be kept clean.*

*Maintaining personal hygiene and hygienic food handling*

*In the absence of refrigerator, food should be stored in hygienic condition—below 10 º or above 50 ºC.*

*Use of gloves while serving large number of person*

*Use of clean containers, potable water*

*Thorough washing of utensils*

**7. In a boarding school, 14 out of 50 students are suffering from scabies. Discuss the line of management.**

**Solution:**

**Information collected by visiting the boarding school**

*List of children residing: Age and sex Personal hygiene practices*

*Residential facilities Close contact of children*

*Presence of overcrowding Sleeping, playing together*

*Regular bathing facilities Sharing cloth, mattress, linen, etc.*

**Epidemiological history:**

*Previous occurrence of same illness*

*Same illness in warden, cook and other staff.*

*H/o visit and stay by outsider*

*H/o student visited and stayed outside.*

**Primary case***: First case who introduced infection.*

**Index case***: First case noticed by the investigator.*

**Diagnosis of disease by**

*Complaint: Itching, worse at night*

*Clinical examination of all inmates:*

*Follicular lesions and secondary infections at:*

*Hand Buttocks*

*Wrist Lower abdomen*

*Extensor aspect of elbow Feet, ankles*

*Axilla Genitals*

*Excluding the other conditions that mimic scabies.*

**Management**

**Confirmation of the diagnosis**

*Microscopic demonstration of itch mite.*

**Treatment:**

*Secondary infections is treated promptly*

*All residents are treated simultaneously (Blanket treatment)*

*First, all infested inmates are given a good scrub bath*

*After bath, 25 percent benzyl benzoate (sarcopticide) is applied all over the body, below the chin. Allowed to dry*

*Application is repeated after 12 hour*

*Thorough bath is given 12 hour after the second application*

*All under clothes, towels, bedsheets and linens should be boiled, washed, sun dried and ironed.*

**Prevention**

*Taking bath daily, washing the clothes regularly*

*Maintaining personal hygiene*

*Improving the standard of living conditions*

*Prevention of overcrowding*

*Avoiding sharing the fomites like clothes, bedsheets, etc.*

*Avoiding contact with scabies person*

*Prompt early diagnosis and treatment*

*Health education regarding the cause and prevention of scabies.*

**8. Morbidity of parasite infestations are frequently reported among slum children. Explain the procedures you adapt to control the problem.**

**Solution:**

**Collection of baseline data**

*By visiting the slum*

*Name and location of the slum:*

*Total population of the slum:*

*Children population of the slum:*

*Availability of health services:*

*Water supply:*

*Toilet facility: At house/At public place/Nil*

*Sewage disposal*

*Environment i. Temperature iii. Type of soil—Sandy/Friable/Clay*

*ii. Moisture iv. Soil, contamination*

*Human habits:*

*Open air defecation Agricultural labor as occupation*

*Child defecation around the house Using untreated sewage for agricultural land*

*Children playing with soil in bare hand and foot Using soil contaminated vegetables without washing*

*Walking bare foot (not using footwear) Improper cooking*

*Social factors:*

*Illiteracy Low socioeconomic condition*

*Low standard of living Ignorance*

**Clinical details of all children of the slum:**

*Name:*

*Age:*

*Sex:*

*Nutritional status: Anemia, vitamin deficiency, protein deficiency*

*Personal hygiene:*

*Clinical features: Anorexia Dull aching abdomen*

*(complaints) Vomiting Diarrhea*

*Allergic manifestations Loss of weight*

*Cough, fever Dyspnea*

*Dermatitis—ground itch Worm in stools*

**Laboratory examination**

*Blood: Hb*

*Eosinophilia*

*Stool: Naked eye examination for parasites*

*Microscopic examination—Iodine preparation, using gram’s iodine for ova and cyst*

**Diagnosis:**

**Assessment of the problem**



**Finding the endemic index for hook worm**

**Chandler index**

|  |  |
| --- | --- |
| **Average number of eggs per gram of stool** | **Inference** |
| *< 200* | *Not much significant* |
| *200–250* | *Potential danger* |
| *250–300* | *Minor public health problem* |
| *> 300* | *Important public health problem* |

**Prevention and control measures**

**Short term measures**

*To reduce the worm load and transmission*

**Deworming**

*Using any one of the antihelminthic drug*

*Albendazole 400 mg all ages above 2 year*

*Piperazine 75 mg/kg orally for 2 day (maximal dose 3.5 gm)*

*Mebendazole 100 mg twice daily for 2 day*

*500 mg single dose*

*Levamisole (Tetramisole) 2.5 mg/kg body weight (max dose 150 mg)*

*single dose*

*Pyrantelpamoate 10 mg/kg (maximum 1 gm) single dose or 3 day*

**Long term measures**

*Interruption of transmission*

*Sanitary disposal of human excreta Improvement in economic status*

*Provision of safe drinking water Improvement of education*

*Food hygiene habits Improvement in living condition*

*Use of sanitary latrines Improvements in quality of life*

*Personal hygiene*

**Treatment of anemia**

*With oral iron and folic acid tablets*

*3 month after treatment, hemoglobin should reach 12 gm*

**Correction of nutritional deficiencies**

*During convalescence, extra food should be given to ensure nutritional recovery.*

**Health education programmes**

*Prevention of soil pollution with human excreta*

*Change in farming practices—Not using untreated raw feces/sewage as fertilizer*

*Community involvement and participation*

*Wearing foot wear: Foot hygiene*

*Using health facilities for early diagnosis and treatment*

**9. A primary school teacher is having a wife and a breast feeding baby. Teacher is suspected to be suffering from pulmonary tuberculosis. How will you manage this situation?**

**Solution:**

*Baseline data collection*

*Name and Address of the teacher: Socioeconomic class:*

*Age: Housing/living condition:*

*Sex: School (occupation) environment:*

*Religion: Habits: Smoking/Alcohol*

*Occupation: Education:*

**Epidemiological Data**

*Family history of TB: Yes/No*

*Any TB case in the neighbourhood: Yes/No*

*Any contact with TB cases: Yes/No*

*Epidemiological indices of TB in the area*

**General examination**

*Weight*

*Nutritional assessment*

**Medical details**

|  |  |
| --- | --- |
| **Symptoms** | **Duration/Details** |
| *Cough*  *Fever*  *Weight loss*  *Others* |  |

*Previous treatment (if taken), details:*

*If discontinued, reasons for discontinuation*

**Laboratory examination**

*Three sputum examinations for AFB (Z-N stain)*

*First examination on-the-spot*

*Second examination on next day morning (over night) (From April 2009, only first two sputum examination is advised)*

*Third examination on next day spot*

*Blood examination: FBS*

*ESR*

**Confirmation of Diagnosis**

*Clinical history*

*Sputum positivity*

*If school teacher is an open case, he is spreading the infection:*

*To school children*

*To co-workers in the school*

*Family members*

*Others*

*Hence, highest priority should be given for early diagnosis and treatment.*

**Treatment**

*Sputum examination report is recorded*

*Teacher is registered and treated under RNTCP*

*Direct observed therapy short term (DOTS) is given*

*According to the DOTS, teacher is stratified under category I for treatment schedule.*

*2 month intensive and 4 month continuation therapy is advised.*

*1. Isoniazid-600 mg 2. Rifampicin-450 mg*

*3. Pyrazinamide-1500 mg 4. Ethambutol-1200 mg*

*H-Isoniazid*

*R-Rifampicin*

*Z-Pyrazinamide*

*E-Ithambutol*

**Intensive phase (2 month)—2 (HRZE)3**

*3 doses/week, all doses are supervised*

**Continuation phase (4 month)—4 (HR)3**

*3 doses/week, first dose of every week is supervised, rest of the doses are self administered*

*Sputum examination is repeated at the end of intensive phase, (i.e. 2 month), then at 4th and 6th month in continuation phase.*

**Advice to patient**

*Take drugs regularly and completely Undergo periodic followup*

*Cover the mouth with cloth while coughing, sneezing Stop smoking*

*Take good food, do regular walking/exercise Hygienic disposal of sputum*

*Avoid indiscriminate spitting*

**Screening of school children**

*Examination of BCG scar, clinical symptoms—Fever, cough, weight loss*

*Suspected child is subjected for*

*Three sputum examination (when child can expectorate)*

*Chest x-rays*

*Gastric lavage and other procedure.*

*- Students found positive, should be promptly treated*

*- Health education is given to children along with their parents.*

**Family members**

*Wife and infant is screened for tuberculosis. If positive, prompt treatment is given*

*INH prophylaxis to baby. If indicated, BCG vaccination is given to the baby if not given earlier.*

**10. A PHC catering 30,000 population has given the data about tuberculosis from January 2008 to December 2008**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **Tuberculin +ve** | **Sputum +ve** |
| *Old cases* | *11,160* | *76* |
| *New cases* | *540* | *25* |
| *Total* | *11,700* | *101* |

**Calculate the relevant epidemiological indices and write the validity of these indices.**

**Solution:**

**Epidemiological indices of tuberculosis**

**

*(Annual infection rate/Tuberculin conversion index)*

**

*= 18 per thousand population per year*

**

**

**

*= 39%*

**

**

*= 0.8 per thousand population*

**

**

**

*= 3.36 per thousand population*

**Validity of epidemiological indices**

**Prevalence of infection**

*High coverage of BCG—Interferes with identification of true prevalence*

*Cross sensitivity by a typical mycobacteria—Over estimate the prevalence*

*Age—Specific prevalence is far superior indictor than mere prevalence of positive reactors.*

**Prevalence of disease (case rate)**

*It is a best index to estimate the case load.*

*Age specific prevalence is much more relevant index.*

**Incidence of infection**

*Reflects the risk of infection in the community*

*It expresses the attack force of TB*

*It is the best indicator for evaluating the problem and trend of infection*

**Incidence of new cases (disease)**

*It reflects the new cases, but not total case load*

*Reveals the impact of programme as well as the direction of the disease*

*Difficult to measure unless case detection is high and reliable*

**Inference**

*All the indicators should be considered together in interpreting the tuberculosis situation of a community*

**11. An anganwadi teacher 30 year is having hypopigmented anesthetic patches on both arms. How do you proceed and provide necessary remedial measures required?**

**Solution:**

*Clinical history suggests the possibility of leprosy lesions in anganwadi teacher.*

**Case taking**

**Basic details of the patient**

*Name: Address:*

*Age: Sex:*

*Education: Occupation: Income:*

*Socioeconomic status:*

*If migrated, details:*

*Living (housing) conditions:*

**Epidemiological data**

*Family history of leprosy:*

*Any similar cases in the family, neighbourhood:*

*H/o contact with similar case:*

*If diagnosed and started treatment, earlier details of treatment:*

*If treatment is discontinued, reason for discontinuation:*

*Duration between onset and diagnosis:*

*Duration between diagnosis and treatment:*

*Total duration between onset and treatment:*

*Leprosy prevalence:*

**Clinical examination**

*Examination for leprosy is done in good day light, from head to toe. Both from front and behind for the evidence of features of leprosy*

**A. Examination of skin lesions**

*Number: Distribution:*

*Size, shape: Pigmentation:*

*Situation: Hair and sweating:*

*Testing for sensation in skin lesions*

*Touch: Heat:*

*Pain: Cold:*

**Muscle testing**

|  |  |  |  |
| --- | --- | --- | --- |
| **Muscle Condition** | **Muscle tested** | | |
|  |  |  |
| *Paresis* |  |  |  |
| *Paralysis* |  |  |  |
| *Movement:*  *Able to move against gravity*  *Able to move towards gravity*  *Not able to perform movement* |  |  |  |

**B. Peripheral nerve examination**

|  |  |  |
| --- | --- | --- |
| **Nerve** | **Thickening** | **Tenderness** |
| *Greater auricular*  *Ulnar*  *Median*  *Dorsal branch of radial*  *Lateral popliteal*  *Other nerve* |  |  |

**C. Examination for deformity and hallmarks of leprosy**

*Face Testes*

*Hand Breast*

*Feet*

**D. Laboratory investigations**

**Skin smear: Site Number of plus\***

*1. First Skin lesion*

*2. Second Skin lesion*

*3. Third Skin lesion*

*4. Fourth Skin lesion*

*5. Left ear lobe*

*6. Right ear lobe*

*7. Nasal smear*

**

*\*Negative No bacilli in 100 fields*

*One plus (+) One or less than one bacilli in each field*

*Two plus (++) Bacilli found in all fields*

*Three plus (+++) Many bacilli found in all fields*

*Classification by BI > 2 < 2*

*Morphological index: Ratio of solid staining bacilli to total number of bacilli*

*Histamine test:*

*Biopsy:*

*Foot pad culture:*

*Immunological tests:*

*Lepromin test—For detecting Cell-mediated immunity (CMI)*

**Diagnosis of leprosy criteria**

*Hypopigmented patches*

*Loss of sensation*

*Thickened/tender nerves*

*Presence of bacteria*

**Classification of leprosy**

|  |  |  |  |
| --- | --- | --- | --- |
| **Features** | **Number of skin lesion** | **Number of nerves involved** | **Skin smear** |
| *Single Skin Lesion leprosy (SSL)* | *1* | *-* | *-ve* |
| *Pauci Bacillary Leprosy (PBL)* | *2–5* | *1* | *-ve* |
| *Multi Bacillary Leprosy (MBL)* | *> 5* | *2 or more* | *+ve* |

**Deformity grading (WHO)—0, 1, 2**

**Treatment**

*Patient is registered and treated under the National leprosy eradication programme (NLEP).*

**Objectives of treatment (MDT)**

*To interrupt transmission*

*To cure the case*

*To prevent drug resistance*

**Treatment schedule**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type of leprosy** | **Duration of treatment (month)** | **Drugs** | | |
| **Rifampicin-600 mg** | **Dapsone-100 mg** | **Clofazemine** |
| *MBL* | *12* | *Once a month supervised* | *Daily self* | *300 mg once a month supervised, 50 mg daily self* |
| *PBL* | *6* | *Once a month supervised* | *Daily self* | *Nil* |

*During treatment patient is observed for lepra reaction. Single dose ROM therapy is discontinued.*

**Follow up surveillance**

*After completion of treatment*

*Paucibacillary once a year for 2 year*

*Multibacillary once in a year for 5 year*

*Patient who does not show evidence of relapse (clinical and bacteriological) during the period of surveillance is released from treatment/control.*

**For close contacts**

*Periodic examination*

*Chemoprophylaxis: Dapsone-4 mg/kg weight per week for 3 year*

*Immunoprophyalxis: BCG (as relevant)*

**Advice**

*Patient: Take drugs regularly and completely*

*Go for periodic check up*

*Hygienic disposal of nasal secretion*

*To use Microcellular foot wear*

*Family: Accept the patient, do not discriminate*

*Motivate for treatment*

*Community: Health education about cause, cure and availability of services*

*Removal of the stigma attached to leprosy*

*Improvements in living standards*

*Creating awareness regarding NLEP*

**Community level activities (Education)**

*Leprosy is not due to sin, it is caused by bacteria*

*Leprosy can be completely cured*

*Early detection of cases by*

*Mass surveys Contact survey*

*School children examination Voluntary referral*

*Examination of slum population Registration of cases for treatment*

*Motivation of affected for early diagnosis and treatment*

**Social support**

*Assistance—Travelling, food, etc. Job replacement*

*Vocational training Abolishing social evils*

**12. In a tribal area where Annual parasite incidence (API) is more than 2, *falciparum* malaria cases have been reported, 2 deaths have occurred. As a medical officer of PHC what action will you take for containment of malaria in that area.**

**Solution:**

**Containment of malaria**

*a. Stratification of the problem*

*Tribal area*

*API > 2*

*P. falciparum reported*

*Deaths reported due to Malaria*

*Under modified plan of operation, given area is categorized as*

*Area with API more than 2 (High risk area)*

*b. Antimalarial activities undertaken*

*Spraying:Regular insecticidal spray*

|  |  |  |
| --- | --- | --- |
| **Insecticide** | **gm/sq meter** | **Number of rounds at 6 week interval** |
| *DDT* | *1* | *2* |
| *Malathion* | *2* | *3* |
| *Synthetic pyrethroid* | *0.25* | *2* |

**Surveillance**

*Both active and passive surveillance is done*

**Active surveillance**

*Surveillance worker visits each house every fort nightly, enquires about*

*a. Fever case in the house at that time*

*b. Any fever case since 15 day (Including guest visitors)*

*If answer is ‘yes’ to any question:*

*Collects blood film—thick and thin on the same slide*

*Gives presumptive treatment—600 mg chloroquine*

*If smear is positive for malaria, surveillance worker returns to the patient and provides radical treatment*

**Passive surveillance**

*Blood smear is taken from all fever cases attending the OPDs.*

*Presumptive treatment is given*

*If smear is positive, radical treatment is given*

**Treatment**

**Presumptive**

*To all suspected cases*

*Day 1—Chloroquine 600 mg single dose + Primaquine 45 mg*

*Day 2—Chloroquine 600 mg*

*Day 3—Chloroquine 300 mg*

*Children 10 mg/kg body weight chloroquine*

*0.75 mg/kg body weight primaquine*

**Radical**

*After microscopic confirmation*

*P.vivax—Tablet primaquine-15 mg daily for 5 day*

*P.falciparum—Not required*

**Resistant Cases—Chloroquin resistant *falciparum***

*Artesunate-4 mg/kg body weight daily for first 3 day +*

*Combination of sulphadoxine-25 mg/kg and Pyrimethamine-1.25 mg/kg single dose on first day*

*(1500 mg + 75 mg)*

*Primaquine—not given for pregnant mother, infants, G6 deficiency, with ACT*

**Severe, Complicated and Unconscious Cases**

*Refer to the higher center and hospitalize where the best facilities are available*

*Quinine dihydrochloride 10 mg/per kg weight IV injection in 5% dextrose run over 4 hour*

*Repeat every 8th hour till patient regains consciousness*

*Switch over to oral drugs after gaining consciousness*

*OR*

*Mefloquine-750 mg for those resistant to chloroquine and ring stage of falciparum*

*Artemisinin-10 mg/kg once daily for 5 day*

**Followup**

*All positive cases after treatment are followed up by blood smear examination monthly for 12 month.*

**Vector control**

*Antiadult measures*

*Antilarval measures*

*Source reduction*

*Integrated control*

*Individual protection*

**Entomological assessment**

*Done by entomologist who suggest appropriate insecticides.*

**Health education**

*Regarding cause, spread, symptoms, treatment and prevention of malaria*

**13. During the year 2009, Ramapura primary health center covering 30,000 population has collected 4,000 peripheral smears by house to house visit. Another 400 slides were collected in the OPD. Results of the microscopic examination of these 4400 slides are given to you**

***Plasmodium vivax* positive 41**

***Plasmodium falciparum* positive 9**

**Total positive 50**

**Calculate the possible malarial parameters and suggest the remedial measures in brief.**

**Solution:**

**Malarial parameters**

**

**

*= 1.6 per thousand population*

**

**

*= 0.3 per thousand population*

**

**

*= 14.6%*

**

**

*= 1.13%*

**

**

*= 0.20%*

**

**

*= 18%*

**Control measures**

*Ramapura PHC can be classified as area with API less than 2*

*According to modified plan of operation (MPO) measures required are:*

*Focal spraying in and around P. falciparum detected house.*

*Active and passive surveillance: (once in 15 day)*

*Mass blood survey of people living around patients home.*

*Treatment: Prompt treatment is given to all detected cases.*

*Follow up: After completion of radical treatment, monthly blood examination should be carried out for 12 month*

*Epidemiological investigation: All +ve cases are to be investigated.*

**14. In a town with 1 lakh population, about 20 children were admitted for high fever during first week of June. 3 children were showing hemorrhagic manifestation, one child is having manifestation of shock. Discuss how do you investigate and manage this problem.**

**Solution:**

*Given clinical illness makes us think about the possibility of a dengue epidemic.*

*Hospital cases represent only the tip of an iceberg. Large number of cases are hidden in the community. This should be explored by Epidemiological investigations.*

**Investigation**

**General information**

*Collected by visiting the place*

*Name of the place:*

*Address: District: State:*

*Health services available:*

*List of person affected: By age, sex, address, other details*

*Environmental factors:*

*ncreased mosquito (Aedes) population:*

*Rainy season:*

*Artificial collection of water in discarded container:*

*Preparation of spot map:*

*Recognition of high, medium, low and nil affected areas:*

**Entomological surveillance—*aedesaegypti* indices**

*House index percent houses showing actual breeding places (kept < 1%)*

*Container index percent of water container that are positive*

*Breteau index: Number of positive containers in 100 houses inspected*

**Case definition**

*Suspected case*

*Probable case*

*Confirmed case*

**Examination**

*Temperature chart Pulse*

*BP Tourniquet test*

*Liver palpation*

**Studying the symptoms**

*Fever, biphasic Mucosal bleeding*

*Arthralgia, severe body pain, myalgia Hematemesis and melena*

*Rash—Scattered petechiae, purpura, ecchymosis Hepatomegaly*

*Headache Low systolic and diastolic blood pressure*

*Retro-orbital pain With pulse pressure < 20 mm Hg*

*Profuse sweating Lymphadenopathy*

*Nausea, vomiting Tourniquet test positive*

*Febrile convulsion Shock*

**Case definition: Dengue hemorrhagic fever (DHF)**

*To define DHF, there should be fever (biphasic) lasting for 2 to 7 day plus two or more other symptoms plus any one lab test positive*

*Hemorrhagic manifestations (at least one of the following)*

*Positive tourniquet test Petechiae, ecchymoses, purpura*

*Bleeding from mucosa, GIT Hematemesis or melena*

*Thrombocytopenia (< 100000 platelets per mm3)*

*Evidence of plasma leakage (due to increase in vascular permeability).*

*Rise in the hematocrit ≥ 20 percent for age and sex*

*Fall in the haematocrit ≥ 20 percent following volume replacement treatment*

**Dengue shock syndrome (DSS)**

*Symptoms of DHF plus evidence of circulatory failure like*

*Rapid and weak pulse*

*Narrow pulse pressure (< 20 mm Hg)*

*Hypotension for age*

*Cold, clammy skin and restlessness.*

**Differential diagnosis**

*Chikungunya*

*Other arboviral infection.*

**Lab confirmation**

*1. Isolation of virus*

*2. Serological—four-fold rising titer of serum antibodies, IgG or IgM in paired serum*

*Dengue virus antigen detection in tissues—In autopsy by immunohistochemistry*

*Polymerase chain reaction (PCR)—Detection of viral genome*

*Hemagglutination inhibition test (antibody response)*

*IgM ELISA*

*3. Biochemical—Hypoproteinemia*

*Clotting factors*

*4. Clinical—ECG, ST-T wave change*

*Radiological changes.*

**Epidemiological Study**

*Confirmation of epidemic*

*Identification of affected and vulnerable population by rapid survey*

*Analysis of data by place, person and time*

*Finding the attack rate—mortality rate.*

**Management**

**Grading of dengue**

*I Uncomplicated dengue*

*II With spontaneous hemorrhage*

*III Shock*

*IV Profound shock, imperceptible pulse, unrecordable BP*

**Treatment**

*DHF and DSS cases are considered as medical emergencies*

*Patients are hospitalized and treated under bedrest*

*Antipyretics, salicylates should not be given*

*Analgesics are used*

*Oral/Parenteral fluids—As needed*

*Patient is monitored till—Platelet and Hematocrit becomes normal.*

**Dengue shock syndrome**

*Admitted in a well equipped hospital*

*Rapid fluid replacement*

*Oxygen*

*Blood transfusion*

*Plasma substitutes—5% albumin IV.*

**Vector control**

**Source reduction**

*Environmental: Modification and manipulation*

**Antilarval measures**

*1 percent temephos*

**Anti-adult measures**

**Following measures are taken—In and around the habitat**

*Space spraying to knockdown the vector*

*Thermal fog—Malathion fogging*

*Ultra-low volume aerosols*

*Mists*

**Personal protection**

*Impregnant bed nets and curtains*

*Insect repellents*

**Health education**

**Surveillance**

*Monitoring the suspected cases*

*Case reporting*

*Epidemiological and entomological investigations.*

**15. During a family visit, Muniyamma’s son Ramu, aged 4 year was having diarrhea since morning. Muniyamma’s daughter Shweta aged 20 month is also suffering from diarrhea for the past 3 day. She is passing loose stools, 10 per day. Her eyes are sunken. Mouth and tongue are dry. She is eager to drink water, but Muniyamma has withheld water and food to her children because of an erroneous belief. How will you manage this situation.**

**Solution:**

*From the case history, it is understood that the children are suffering from diarrhea*

*Management of diarrhea in order of priority is:*

*Assessment of dehydration*

*Fluid and electrolyte management*

*Nutritional management*

*Treatment of cause*

*Preventive measures.*

**Fluid management**

**Assessment of dehydration:**

**By history and examination Ramu Shweta**

*On History*

*Stools per day 2 10*

*Vomiting Nil Often*

*Thirst Normal More*

*Urine output Normal Scanty/reduced*

*Tears Present Absent*

**On examination**

*General condition Well, alert Dull/irritable*

*Mouth and tongue Moist Dry*

*Eye Normal Sunken*

*Skin pinch—going back Quickly Slowly*

*Pulse Normal Rapid, feeble*

*Breathing Normal Rapid*

*Temperature Normal Increased*

*Anterior fontanelle Normal Sunken*

**Inference No dehydration Some dehydration**

**Collection of contributory factors**

*Age of the child H/o prematurity*

*Breast feeding Proper weaning*

*Immunization Growth and development*

*Socioeconomic status Flies in and around the house*

*Water supply Use of latrine*

*Hygiene—personal, domestic and food*

*Infection—TB, malaria, pneumonia, etc.*

**Fluid and electrolyte management**

*Early replacement of fluid losses is the most important part in managing childhood diarrhea.*

**For Ramu (Diarrhea with no dehydration)**

*Offer fluids frequently at home, as much quantity as the child can take orally.*

*Home fluid Butter milk Coconut water*

*Rice kanji Fruit juice*

*Weak tea Lemon sherabat with salt*

*Homemade rehydration solution (HRS)*

*Prepared at home by mixing*

*8 level tea spoon of sugar 40 gm (closed fist full)*

*1 level spoonful of table salt 5 gm (3 finger pinch up to 1st crease)*

*Potable water 1 liter*

*Puffed rice powder 50 gm can be substituted for sugar.*

**For Shweta (Some dehydration)**

*Oral rehydration solution (composition very recently approved by WHO) i.e.*

|  |  |
| --- | --- |
| *Glucose 13.5 gm*  *Sodium chloride 2.5 gm*  *Trisodium citrate 2.9 gm or*  *Sodium bicarbonate 2.5 gm*  *Potassium chloride 1.5 gm*  *Potable water 1 liter* | *Sodium 75 mEq/L*  *Potassium 20 mEq/L*  *Chloride 65 mEq/L*  *Bicarbonate 10 mEq/L*  *Glucose 75 mEq/L* |

*ORS once prepared, should not be boiled*

*Fresh solution is to be prepared each time*

*Extraneous contamination is to be avoided*

*Fluid to be used within 6 hour after preparation*

*Left over fluid must be discarded*

*ORS is given frequently, in small amounts by using clean cup and spoon.*

*During the first 4 hour, ORS given in ml = weight of child in kg × 75*

*For each diarrheal stool, extra 100 ml of ORS is given*

*Normal feeding (breast feeding is continued for breastfed babies).*

**Assessment of hydration is done after 4 to 6 hour**

*If the child is still severely dehydrated*

*Signs of moderate dehydration continue*

*Child is drowsy, pulse is weak, has not passed urine*

*Extremities are cold*

*Child is admitted to hospital and intravenous drip of Ringer’s lactate solution is given.*

*30 ml/kg body weight in the first hour*

*20 ml/kg body weight in the next 3 hour*

*(if child has passed urine) rehydration is completed*

*Once the child’s condition improves and starts taking liquid orally, IV drip is to be discontinued. ORS is to be kept in continuation*

**Nutritional management**

*Mother should be enlightened about benefits of nutrition*

*The child should be given regular formula milk*

*Easily digestible food should be selected*

*Small but frequent feeding is to be given*

*Well cooked rice, dal, bananas, fruit juice and small quantities of nutritionally rich food is given.*

**During convalescence**

*More food is given to restore and compensate the loss and promote early recovery.*

**Treatment of cause**

*Usually diarrhea (except for Shigella, Vibrio, E-coli, Entamoeba, Giardia) does not require any drug. (Most common cause of diarrhea in India is viral infection)*

*Symptomatic treatment is given if there is vomiting, abdominal distention, convulsion, etc.*

**Clinical Approach**

*For diagnosis—By signs and symptoms, nature of stool*

*Finding the cause—By laboratory investigation*

*Laboratory investigation is not essential for effective management*

*But essential for academic interest -*

*Naked eye examination of stool Reaction (pH) of stools*

*Blood—Electrolytes, osmolality ELISA*

*Test for presence of toxins*

*Microscopic examination for pus cells, red cells, cellular exudates, cysts, vegetative form and rotavirus (Electron microscopy).*

**Prevention**

**At home level**

*Proper washing of hands with soap and water before feeding and after toilet.*

*Good food hygiene and personal hygiene practices*

*Using potable, preferably boiled water*

*Clean utensils and containers are to be used for food and water*

*Vegetables and fruits should be washed, cooked before being fed to the child*

*Protection of food from contamination with dust, flies, cockroaches, rodents during preparation, storage and at the time of eating*

*Good water supply, adequate sewage and garbage disposal.*

*Avoid consumption of sweets, cut fruits kept open and sold in roadside*

*Clean the drinking watertank once in 15 day*

**At community level**

*Improving nutritional status of children*

*Routine immunization*

*IEC - Information, education, communication*

*Health, education and communication*

*a. To treat diarrhea at home by using home available fluids and ORS.*

*b. Environmental sanitation and food hygiene.*

*Promotion of exclusive breast feeding and proper weaning.*

*Primary health care approach–Child survival and safe motherhood (CSSM), ‘GOBI’ campaign of Unicef*

*Keep public water tap clean*

*Keep home and surroundings clean*

*Construction and use of sanitary latrines*

*Improving maternal nutrition and MCH care*

*Fly control measures*

*Periodic epidemiological surveillance of diarrhea.*

**16. You are posted to a PHC where tetanus is occurring freqently. How do you manage the situation?**

**Solution:**

**Baseline Information**

*PHC: Population coverage*

*Details about persons affected: Age, sex, occupation, education, social class, etc*

*Distribution of disease by time, place, person*

*Cultural practices in the area favoring tetanus.*

**Management**

**Wound treatment**

*All injuries will be treated at PHC/SC*

*Proper cleaning of wound*

*Suturing, if necessary*

*Sterile dressing*

*TT prophylaxis*

**Delivery practices**

*Clean delivery practices (5 clean) by trained dai and PHC staff, under aseptic precautions*

*Institutional deliveries are encouraged.*

**Sterilization in hospitals**

*Autoclaving of instruments*

*Regular fumigation*

*Sterile bandage.*

**TT immunization is advised for:**

*Antenatal mothers—2 doses at pregnancy at 16 and 36 week, (1 dose, if subsequent pregnancy occurs within 3 year. If the pregnant mother is not immunized, at least 1 dose is given 3 week before delivery)*

*Infants and children—routine immunization schedule*

*Women of childbearing age*

*Wound, burns, ulcers, otorrhea, piles, nose pricking and any injury*

*Tooth extraction, circumcision and other minor procedures*

*People working with soil*

*Patients recovered from tetanus*

*Infant born to unimmunized mother—TT is given along with immunoglobulin within 6 hour of birth and followed with regular immunization.*

**Regular immunization advice for all adults**

*0 Elected day*

*1 1 month*

*2 6 month*

*3 1 year*

*4 5 year*

**Active immunization**

*For all population*

**Passive immunization**

*For all exposed, but unimmunized cases*

*Anti-tetanus serum (ATS)-1,500 unit/human gammaglobulin 250–500 unit (TIG).*

**Health education**

*Hygienic keeping of animals and animal shelter*

*Preventing indiscriminate fouling of soil with human and animal excreta*

*Avoiding playing, and walking in bare foot, in contaminated soil*

*Avoiding smearing the wound with soil*

*Treatment of wound should not be neglected*

*Taking proper immunization*

*Maintenance of menstrual and puerperal hygiene*

*Avoiding unhygienic ear, nose pricking, branding, circumcision, tattoo, etc.*

*Motivating deliveries by trained dai under aseptic conditions*

*Reducing domesticated animals by replacing them with machines*

*Reporting to the health authority regarding the disease.*

**Monitoring**

*Checking Antenatal care (ANC) registration/TT coverage*

*Supply of delivery kit and promotion of clean delivery practices*

*Undertaking health education activities for the community*

*Field monitoring: Wound management in hospital*

*Delivery conducted by trained dai*

*Tetanus sessions for ANC.*

**Surveillance**

**17. A boy of 7 year was brought to you with history of dog bite on the hand and fingers with bleeding, 2 hour back. How do you manage this case as a medical officer?**

**Solution:**

**Taking history in detail**

*Name, age, address, locality*

*Time and place of bite*

*Type of dog: Pet, street, domestic, stray, wild*

*Other persons bitten by the same dog*

*Provoked or unprovoked bite*

*Possibility of watching the bitten dog for 10 day*

*Animal showing signs of rabies.*

**Wound details**

*Site of wound, distance from the brain*

*Type of Bite—Superficial, deep or mere lick*

*Number of bites*

*Bite—Bare skin or interposing cloth.*

**Classification of bite**

*As bite is on hand and fingers, bite is considered as class III bite.*

**Management**

*Wound management*

*Antibiotics and tetanus toxoid: To prevent infection and tetanus*

*Antirabiesimmunoprophylaxis*

*Watching the dog for 10 day.*

**Wound management**

Aim

*Removal and destruction of rabies virus in the wound*

*To remove the saliva remains, dirt and foreign bodies*

**Methods adopted**

*Physical*

*Chemical*

*Immunological.*

Physical

*Wound treatment is of paramount importance*

*Wound treatment is given as early as possible*

*Wound is cleaned*

*Flushing and washing the wound and adjoining area with plenty of soap and water, under running tap water for at least 5 minute*

*Punctured wound is irrigated by using catheters.*

Chemical

*To inactivate remaining virus, following chemicals are used-*

*Tincture*

*Iodine 0.01%*

*Povidine iodine*

*To inactivate/destroy remaining virus in the wound spirit, alcohol tincture iodine can be used as they act by dissolving the lipid membrane of the virus.*

*Quaternary ammonium compounds like SavlonCetavlon should not be used. Cauterization by using carbolic/nitric acid should not be done.*

*Suturingcauses further trauma, and helps in spread of virus into deeper tissues. Hence, suturing should not be done immediately. If necessary, suturing is done after 48 hour of applying immunoglobulin.*

*Bandage: Wound is left open, unbandaged.*

Immunological: Immunoglobulin

*Immunoglobulin is the best prophylaxis for rabies exposure*

*Prevents the replication of virus*

*Prolongs the incubation period*

*Given after sensitivity test*

*Complete protection is ensured only by giving immunoglobulins immediately after exposure, followed by complete course of vaccine.*

**Passive immunization**

**Immunoglobulin schedule**

|  |  |  |  |
| --- | --- | --- | --- |
| **Rabies Immunoglobulin** | **Preparation concentration per ml** | **Dose/kg body weight** | **Maximal dose** |
| *HRIG* | *150 IU* | *20 IU* | *1500 IU* |
| *ERIG* | *300 IU* | *0.134 ml* | *10 ml* |

*HRIG - Human rabies immunoglobulin, ERIG-Equine rabies immunoglobulin*

*Major part of the dose is administered around the wound as palm and finger bite is class III bite. Rest is injected intramuscularly to the gluteal region.*

**Active immunization**

*Cell cultured vaccine like purified inactivated duck embryo vaccine (PDEV) or human diploid cell vaccine (HDCV) or purified chick embryo vaccine (PCEV), purified vero cell cultured vaccine (PVCV) is used*

*Vaccine is given as prophylactic, prevents establishment of virus in peripheral nerve*

*Intramuscular injections are given to deltoid region not to gluteal region .*

*Dose—0.5 to 1 ml*

*Schedule—0, 3, 7, 14, 28, 90*

**Advice to patient/attendant**

*Take complete treatment timely. There is no contraindication for Rabies vaccine*

*Avoid steroid, chloroquin, and immunosuppressive drugs*

*Avoid physical and mental strain, late nights and alcohol*

*Report immediately in case of fever, pain, stiffness in neck and limbs*

*People are educated to seek treatment for all dog bites, even if it is a small pup.*

*There is no secondary prevention, except ensuring a comfortable death.*

**18. On March 20th 2009, an outbreak of A/H1N1 influenza occurred in Mexico. By 29th April neighboring nine countries have reported 148 confirmed cases including seven deaths. WHO has declared it as pandemic imminent (phase 5). Outline the measures to be taken in the country.**

**Solution:**

*India is a influenza A/H1N1 receptive area*

*Population of the country is susceptible to A/H1N1 virus*

*Infection can enter through clinical/subclinical travelers*

*International health regulations of WHO are adopted to restrict the entry and spread of infection*

*Strict aerial and marine traffic regulation is undertaken.*

**Regulations for travelers**

*Restriction of travel in close borders*

*Examination of all travelers from affected countries*

*Quarantine for longest incubation period for such travelers*

*If any infected case is noticed, all the copassengers and their contacts should be traced and examined for the disease.*

**Outbreak response and pandemic preparedness plans**

*Identification of hospitals for treatment*

*Reserving beds for isolation of patient in government, private hospitals*

*Utilization of doctors specialized in treating chest infections*

*Arrangements for sufficient drugs, equipment, manpower, transport, communication, etc.*

*Notification of disease*

*Request for national and international assistance and support*

*Containment for affected country. Alert phase to other countries*

*Detaining high-risk population.*

**Early detection and treatment**

*Screening of all travelers at airport*

*Co-travelers of the suspects are identified and screened.*

**Defining the disease**

*Individuals with positive test for influenza A/H1N1*

*Clinical compatible illness or having died with unexplained acute respiratory illness linked to be probable or confirmed case.*

**Clinical description**

*Acute febrile (> 38 0c) respiratory illness, ranging from influenza like illness to pneumonia.*

**Laboratory confirmation**

*Sample has to be flown by air to National Institute of Virology (NIV), Pune or National Institute of Communicable Diseases (NICD), Delhi.*

*Confirmation tests:*

*Real time RT-PCR*

*Viral culture*

*Four-fold increase in swine influenza (A/H1N1) virus neutralizing antibodies*

**Case management**

*Isolation*

*Drug (treatment): Tamiflu—Recommended only for confirmed cases*

*In non-confirmed cases: Tamiflu is not administered, as the drug has serious side effects*

*Every case of influenza or pneumonia is rigorously isolated*

*Rapid containment measures are adopted*

*Reviewing and revising pandemic plans by periodic comprehensive assessment*

*Vaccination: No vaccine available, human seasonal flu vaccine will not give any protection.*

**Assessment of situation**

*Rapid but detailed investigation by epidemiological experts*

*Assessment of disease: Virological, epidemiological, clinical*

*Geographic analysis: Trend, spread, intensity, impact.*

**Health education, awareness and advice**

*Given throughout the country through mass media*

*Reassurance and relieving anxiety is essential as people will be panic during the pandemic*

*Preventing exposure to pigs and infected humans*

*Do not shake hands, hug or kiss socially*

*Do not practice indiscriminate spitting, coughing, sneezing, hawking in public places*

*Cover mouth and nose with handkerchief while talking, coughing or sneezing*

*Wash hands frequently, thoroughly with soap and water, before and after touching nose, mouth, eyes*

*Avoid overcrowded places*

*Work, sleep in a ventilated room*

*Drink potable water, eat nutritious food, manage stress, avoid alcohol*

*Stay at home and limit contact with people*

*Use close woven muslin gauze of three to six layers mask which is compulsory for family members of the person affected. Volunteers, medical personnel and others who come in contact with the sick must use mask (N 95 particulate filter)*

*Do not take drugs (medicines) without consulting physician*

*If necessary, schools, offices, etc may be closed to limit the gathering.*

**Monitoring and surveillance**

*Routine surveillance for Influenza like illness (ILI) and Severe acute respiratory illness (SARI)*

*Changes in phases of pandemic*

*Strong surveillance system to prevent the disease entry.*

**19. In a rural primary school, large number of children are having Bitot’s spots. What advice can you give for managing the problem?**

**Solution:**

*Bitot’s spot denotes vitamin ‘A’ deficiency.*

*Managing steps are the following.*

**Immediate measures**

*Early diagnosis and treatment.*

**Diagnosis**

*All children of the school are examined for the evidence of Bitot’s spots and other manifestations of vitamin ‘A’ deficiency.*

**Treatment**

*Immediately after diagnosis:*

*Massive dose of vitamin ‘A’ (2 lakh IU > 1 year, 1 lakh IU < 1 year) is given orally for 2 day*

*One more dose is given 4 week later.*

*In case of persistent vomiting or diarrhea, water miscible vitamin A is given by IM.*

**Long term measures**

**Health promotion**

**Promotion of vitamin ‘A’ rich foods**

*Regular and adequate intake of retinol/vitamin ‘A’ rich foods like dark green leafy vegetables, carrot, drumstick leaves, mango, papaya, milk, egg, butter, oil, fish, etc. Children require 400 to 600 µg of vitamin A per day*

*Promotion of breast feeding*

*Control of infections (that precipitates vitamin A deficiency) like*

*Respiratory infections*

*Measles*

*Diarrhea.*

**Specific protection**

*To prevent occurrence and recurrence of vitamin ‘A’ deficiency, vitamin ‘A’ prophylaxis is given*

**National vitamin ‘a’ prophylaxis (under CSSM)**

**Schedule: 9 lakh IU in 5 oral dose**

|  |  |  |
| --- | --- | --- |
| **Dose number** | **Age (month)** | **Oral dose (IU)** |
| *1* | *9* | *100,000* |
| *2* | *18* | *200,000* |
| *3* | *24* | *200,000* |
| *4* | *30* | *200,000* |
| *5* | *36* | *200,000* |

*For every child between 9 month and 3 year of age vitamin A prophylaxis is given*

*Recently, prophylaxis has been extended up to the age of 5 year and given every 6 month*

*One spoon of 2 ml concentrate contains 2 lakh IU (equivalent to 100 mg of retinol palmate)*

*Once the bottle is opened, it is to be utilized within 2 month*

*Fortification: Fortification of oil, dalda, atta, sugar with vitamin ‘A’*

*Nutritional education: To school children and the community*

*Socioeconomic and educational developments*

*Evaluation of the program.*

**20. Poor anemic women of gravida 3, and in third trimester of pregnancy has attended PHC for the first time. Her Hb is 7.5 gm/dl, weight is 50 kg. How do you manage?**

**Solution:**

*From the case history, we can recognize following risk factors.*

*Severe anemia Poverty, lack of nutrition*

*Multigravida Lack of health-seeking behavior.*

*Not taken antenatal care*

**Investigations for the cause of anemia**

*History:*

*Cause of blood loss:*

*Diet practice*

*Lab investigations:*

*Stools: For hookworm*

*Occult blood*

*Blood: Complete hemogram*

**Management**

*Pregnant mother should have minimum 12 gm/dl of hemoglobin.*

*Here women is having only 7.5 gm/dl*

*Anemia should be corrected immediately by parental iron therapy.*

**Treatment plan**

|  |  |  |
| --- | --- | --- |
| **Hb** | **Severity of Anemia** | **Treatment** |
| *< 10 g/dl* | *High* | *Parenteral iron or*  *Blood transmission* |
| *10-12 gm/dl* | *Low* | *Oral iron supplementation* |

**Calculation of iron requirement in mg**

*= Normal Hb - patient Hb x weight in kg x 2.21 + 1000*

*= (12 gm/dl - 7.5) × 50 × 2.21 + 1000*

*= 4.5 × 50 × 2.21 + 1000*

*= 497.25 + 1000*

*= 1497.25 mg, to round up 1500 mg*

*Iron requirement is 1,500 mg*

*Inferon (100 mg) is given IM daily for 15 day*

*Oral treatment is continued for 3 month after Hb has returned to normal*

*Assessment of hemoglobin periodically.*

**Preventive measures**

*Woman is advised to take more iron-rich foods: Leafy vegetables*

*Advised to attend supplementary feeding programme, at Anganwadi (ICDS)*

*Advised to take antenatal care*

*Health education regarding anemia*

*Improvement of socioeconomical problems*

*Advised for institutional delivery*

*Advised to undergo tubectomy.*