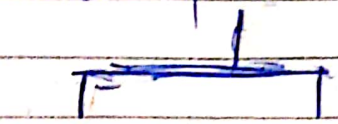
Schizophrenic Disease

(prediction in offsprings)

Total population = 7 Billion

Total schizophrenic patients = 7 million (1% of total)

Dividing the population in two parts



NP (Non-patient population) PP (patient population)

⇒ A schizophrenic gene has two alleles 'B' and 'b'

(Dominant) (Recessive)

Calculating allele Freq, From Hardy Weinberg Equilibrium

According to HWE: $\boxed{p^2 + 2pq + q^2 = 1}$

∴ In NP population: $q^2 = 1\%$

$\therefore q^2 = 0.01$

$\therefore \boxed{q = 0.1}$ NP

As $\boxed{p + q = 1}$ ∴ $\boxed{p = 0.9}$ NP

Similarly in PP population we can find values of p and q

∴

Now, Based on the allele Frequency, we will predict the odds of schizophrenia in offsprings

Total 3 cases are possible

1) offspring is result of PP x PP
(Both parents are schizo. patient)

2) offspring is result of PP x NP
(One parent is a schizo. patient)

3) offspring is result of NP x NP
(Both parents are non schizophrenic)

∴ In case 1.)

	B	b
B	BB	Bb
b	bB	bb

0.8 to 0.9 — B

b

0.2 to 0.1

∴ Chances of schizophrenia is very high = P(BB + 2·Bb)

For case 2) NP x PP

	B	b
0.8 ← B	BB	Bb
0.2 ← b	bB	bb

B → NP B = 0.01, b = 0.99

PP

∴ Here the chances are still high but less than case 1)

Exact probability = P(B·B + 2·B·b)
PP NP

For case 3) NP x NP

	B	b
B	BB	bB
b	Bb	bb

Here, b = 0.99, B = 0.01

For both

∴ chances of schizophrenia are very slim in this case compared to the previous two