A study was conducted to look at the ability of clinicians to diagnose streptococcal infection without a throat culture positive for group A streptococcus. The study included 213 patients coming to the emergency room with sore throats. The doctors’ clinical assessment were compared to results of throat cultures. Fifty-eight patients had throat cultures positive for group A streptococcus, and forty-four of these were diagnosed by doctors as having strep throat. One hundred fifty-five patients had negative cultures, and doctors diagnosed 53 of these as having strep throat.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table 1** | 1 | | 2 |
| 3 | 6 | 7 | **Total** |
| 4 | a | b | 8 |
| 5 | c | d | 9 |
| **Total** |  |  |  |

**For each of questions 1-4, please select the one best answer**

1. Using the 2x2 table above, where do we place the test we are evaluating?
   1. On the right side of the table (In the cell numbered “2” in the 2x2 table above)
   2. On top of the table (“1” in the 2x2 table above)
   3. On the left side of the table (“3” in the 2x2 table above)
   4. None of the above

1. Using the 2x2 table above, where do we place the gold standard we apply?
   1. On the right side of the table (“2” in the 2x2 table above)
   2. On top of the table (“1” in the 2x2 table above)
   3. On the left side of the table (“3” in the 2x2 table above)
   4. None of the above
2. What are we evaluating in this study?
   1. The group A streptococcus culture
   2. The emergency room effectiveness
   3. The doctors’ treatment
   4. The doctors’ clinical (without culture) diagnosis of streptococcal infection
3. The gold standard is what is “widely recognized as the best available”. Which gold standard are we using in this study to evaluate our test?
   1. The doctors’ clinical assessment
   2. The patients’ assessment of their disease
   3. The group A streptococcus culture
   4. The assessment by the emergency room nurse
4. From the information given, please select the correct markings from the numbers and letters given in the 2x2 table below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table 1** | 1 | | 2 |
| 3 | 6 | 7 | **Total** |
| 4 | a | b | 8 |
| 5 | c | d | 9 |
| **Total** |  |  |  |

* 1. Doctors’ diagnosis positive
  2. Doctors’ diagnosis negative
  3. Group A streptococcus culture positive
  4. Group A streptococcus culture negative
  5. 44
  6. 14
  7. 53
  8. 102

**Match options:**

1. c
2. 6
3. a
4. 8
5. 4
6. d
7. 7
8. 9
9. 5
10. b
11. **Please match each of the following questions with the appropriate lettered statement below.**
    1. In this study, how good was the doctors’ clinical assessment at identifying people with strep throat?
    2. How good was the doctors’ clinical assessment at identifying

people who did not have strep throat?

* 1. If, after clinical assessment, the doctor concluded that the patient

had strep throat, what was the probability that the patient had the

disease?

* 1. If the doctor thought that the patient did not have strep throat, for

what percent of the patients was the doctor correct?

* 1. How common was strep throat in patients coming to the

emergency room?

1. **PV-** = Probability of no disease when the test result is negative
2. **Sp** = Proportion without disease with a negative test result
3. **False Positives** = Proportion without disease with a positive test result
4. **Prevalence** = What was the usual level of strep throat in the emergency room population?
5. **Se** = Proportion with disease with a positive test result
6. **False Negatives** = Proportion with disease with a negative test result
7. **PV+** = Probability of disease when the test result is positive
8. **Please march each of the following questions with the appropriate calculation below.** 
   1. In this study, how good was the doctors’ clinical assessment at

identifying people with strep throat?

* 1. What was the specificity of the doctors’ clinical assessment of

strep throat?

* 1. If, after clinical assessment, the doctor concluded that the patient

had strep throat, what was the probability that the patient had the disease?

* 1. If the doctor thought that the patient did not have strep throat, for

what percent of the patients was the doctor correct?

* 1. How common was strep throat in patients coming to the

emergency room?

**H.**

**53**

**155**

**x 100**

**= 34.2%**

**G.**

**44**

**97**

**x 100**

**= 45.4%**

**F.**

**44**

**58**

**x 100**

**= 75.9%**

**E.**

**102**

**155**6

**x 100**

**=** **65.8%**

**A.**

**58**

**213**6

**x 100**

**=** **27.2%**

**D.**

**102**

**116**

**x 100**

**= 87.9%**

**C.**

**44**

**53**

**x 100**

**= 83.0%**

**B.**

**14**

**116**

**x 100**

**= 12.1%**

1. An evaluation was conducted of screening for lung cancer with computed tomography (CT). The subjects underwent baseline evaluations in 2001, with repeat examinations in 2002 and 2003. A diagnosis of lung cancer was confirmed by biopsy (gold standard). A summary of the combined results is shown in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table2. CANCER** | | | |
| **CT result** | **Present** | **Absent** | **Total** |
| Positive | 77 | 602 | 679 |
| Negative | 5 | 15,310 | 15,315 |
| **Total** | 82 | 15,912 | 15,994 |

**Please match each of the following questions with the appropriate calculation below.**

1. What was the **prevalence** of lung cancer (%) in the population?
2. What was the **sensitivity** (%) of the CT in identifying subjects with

lung cancer?

1. What was the **specificity** (%) of the CT in identifying subjects

without lung cancer?

1. What proportion had positive test results (%)?
2. What was the **accuracy** (%) of the CT test?
3. What proportion were **false-positives** (%)?
4. What proportion were **false-negatives** (%)?
5. For subjects with positive CT scans, what was the **probability** that they had lung cancer?
6. For subjects with negative CT scans, what was the **probability**

that they did not have lung cancer?

**77+15,310**

**x 100 = 96.2%**

**A.**

**15,994**

**679**

**x 100 = 4.2%**

**J.**

**15,994**

**77**

**x 100 = 93.9%**

**I.**

**77 + 5**

**77**

**x 100 = 11.3%**

**H.**

**77 + 602**

**15,310**

**x 100 = 96.2%**

**G.**

**15,310 + 602**

**602**

**x 100 = 3.8%**

**F.**

**15,912**

**15,310**

**x 100 = 99.97%**

**C.**

**15,310 + 5**

**82**

**x 100 = 0.51%**

**D.**

**15,994**

**15,315**

**x 100 = 95.8%**

**E.**

**15,994**

**5**

**x 100 = 6.1%**

**B.**

**82**