Original Article

Assessment of Veterinary Vaccine Safety by Using Spreadsheet Software

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Abstract

Assessment of veterinary vaccine safety is often done by veterinarians in animal houses in biological units using conventional methods which is a basically a complex and time consuming. In today's era of Smart phones, tablet PCs and Netbooks where a spreadsheet program in the form of Excel is readily accessible by most veterinarians, it should be possible to adapt the various laborious steps involved in the said method to a spreadsheet program. In this article we have designed a spreadsheet program based on the steps involved in conventional method for assessment of vaccine safety.

Keywords: Smart phones; Netbooks; Excel; Spreadsheet.

Introduction

Assessment of veterinary vaccine safety is often done by veterinarians in animal houses in biological units. The more reliable method we use for the assessment of vaccine safety is conventional method which is described below. The calculations involved in that assessment are complex, confusing, time consuming and less easily reproducible. In today's era of Smart phones, tablet PCs and Notebooks where a spreadsheet program in the form of Excel is readily accessible by most veterinarians, it should be possible to adapt the various laborious steps involved in the said method to a spreadsheet program. This way the laborious steps involved in the method can be easily calculated in a simple, clear, faster, reproducible, accurate and user-friendly manner. The aim of this article is to design a spreadsheet program based on the steps involved in conventional method for assessment of vaccine safety and check the accuracy of such spreadsheet program (Figure 1) for the extremes of values in the assessments.

Materials and Methods

The spreadsheet program is based on the various steps for evaluation of vaccine safety by conventional method [2]. According to which 20 animals, those preferably do not have antibodies against rabies virus have to be selected for the safety test. Each animal has to be administered with vaccine by a recommended route a double dose of the vaccine. Observe the animals at least daily for 14 days and clinical signs have to be noted down daily in a prescribed form. The clinical signs to be noted down are:

1. Ruffled fur
2. Hunched back
3. Slow movements
4. Loss of alertness
5. Circular movements

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6.   Shaky movements

7.   Trembling

8.   Convulsions

9.   Paresis

10. Paralysis

11. Moribund state

The spreadsheet program used was Microsoft Excel version 2013. One representative study is presented to help understand the usefulness of this program. The findings of the experiment along with the calculation are presented in the sheet which was based on the said method. The logical data

Fig. 1: Snapshot taken from the actual spreadsheet of safety assessment(Spreadsheet software)

Vaccine safety calculator		Example of a chart used to record clinical Signs in the rabies vaccine potency test									
		days after challenge of Rabies vaccine									
S.No	Clinical signs	6	7	8	9	10	11	12	13	14	Total no. of mice with the specified sign
1	Ruffled fur	0	1	1	1	1	1	1	1	1	1
2	Hunched back	0	0	0	0	0	0	0	0	0	0
3	Slow movements	0	0	0	0	0	0	0	0	0	0
4	Loss of alertness	0	0	0	0	0	1	1	1	1	1
5	Circular movements	0	0	0	0	0	0	0	0	0	0
6	Shaky movements	0	0	0	0	0	0	0	0	0	0
7	Trembling	0	0	0	0	0	0	0	1	1	1
8	Convulsions	0	0	0	0	0	0	0	0	0	0
9	Paresis	0	0	0	0	0	0	0	0	0	0
10	Paralysis	0	0	0	0	0	0	0	0	0	0
11	Moribund state	0	0	0	0	0	0	0	0	0	0
12	Total no. of mice with atleast one of the sign										3
	percent of animals showing rabies signs										15
	Result of rabies safety test										PAS

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suggestions and Feedback

incorporated in this spreadsheet is (in L17 cell) =IF(L16<=15, "PASS","FAIL").

Results

A spreadsheet program for the vaccine safety assessment is presented. It may be noted that the calculations in the spreadsheet program are accurate from the representative examples provided above. If the percent of the mice showing rabies signs exceeds 15 then the test is said to be failed alternatively the vaccine complies with the test if no or only less than 15 percent animals shows notable signs of disease or dies from causes attributable to the vaccine.

Discussion

A spreadsheet is a computer application that simulates an accounting worksheet. It displays multiple cells which together make up a grid comprising of rows and columns. It can be used to store, process, analyse and graphically represent data. A formula entered in a cell in the spreadsheet defines how the content of that cell is to be calculated from the contents of any other cell(s) each time the content of the other cell(s) is updated. VisiCalc is historically regarded as the first spreadsheet application (year 1979). The spreadsheet application which is most popular currently is familiar to most of us as Microsoft Excel [1]. Although an Excel spreadsheet is ideal for arranging entries in columns and rows, that's not its main purpose. One can do that with a table in a word processing application like Microsoft Word. What makes a spreadsheet so powerful is that it can perform calculations using various values from the spreadsheet. It was hoped that this program which was freely usable was useful to all veterinary doctors who are working at biological units.

Conclusion

The difficulty which usually concerns veterinarians at biological units is the vaccine safety assessment. We often encountered various problems

which were listed below: (a) the calculations involved in the assessment are time consuming. (b) The calculations appear confusing when reviewed at a later date. (c) It is often difficult to explain in the theses or discussions how a final figure was arrived at. With a goal to simplify the calculation, we have explored the possibility of adapting the conventional method to a spreadsheet. With this, the calculations happen automatically and they are reproducible in the form of a printout which can easily explain how the final figure was arrived at in the theses and discussions. The spreadsheet makes the whole process of assessment faster and user friendly. The program was thoroughly tested for the entire range of values which are possible. One representative study was also presented to help understand the applicability of this program.

References

1. http://office.microsoft.com/en.us/excel
2. British Pharmacopoeia Commission, 2015.

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