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Contribution of a Computerised Tool to the Quality of a High-risk Grouping of Patients for 7 Cancers in General Practice

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Cancer screening is an important stake to decrease the morbidity and mortality of these diseases. In France, programmes of mass screening are organised mainly for breast and colon cancer but their efficiency among the population is poor. Individual screening by the general practitioner is not common because, without the appropriate tools, its implementation is difficult.

To promote an Organised Individual Screening (OIS) for 7 cancers, the SFMG conceived a computerised unit and had it developed. This unit permits to group the patients according to the degree of risks as regards the 7 cancers.
Thanks to a comparative study, we wanted to evaluate the number and the relevance of cancer screening realised by a group of practitioners who had no systems of references, no computer help as well as by a group of practitioners using a computer unit adapted to screening.

Material and method

2 groups of 50 practitioners realised risk grouping for 7 cancers for one month from 19 May to 18 June 2003.
The first group (DPIO) used a computer software dedicated to screening (box 1). The practitioner indicated whether there was any sign of predifinite risk factor (tick the answer) and the software automatically calculated the risk group of the patient thanks to an algorithm. These groupings were considered as valid in so far as they used algorithms based on international studies ratified by the scientific council of the study.
The other group (EMR) used an electronic medical record (box 2) without algorithm on risk calculation. The practitioner chose the risk factors of the patient in a list and indicated the risk grouping only thanks to his knowledge.

The practitioner who volunteered were recruited all throughout France by advertisements in the press to apply for candidacy.

The comparison was focused on the number and on the relevance of the risk groupings realised for each cancer. The risk groupings were as follow : Non Concerned (because of age or sex), Average Risk (the case of most of the population), Increased Risk, Important Risk, Very Important Risk.

At the end of the first month, the practitioners from both groups extracted the data from their medical software or from the DPIO software and sent them coded to the SFMG.
The data were integrated to Diogène, the Oracle data base of the SFMG.
As far as the EMR group was concerned, the medical information department of he SFMG recalculated the risk group of each grouping according to the risk factors and using the same algorithms as the ones used by the DPIO software.

Results

At the end of the first month, there was no significant dif-ference between the 2 groups of investigators, either on the number of patients or on the average of patients seen by the practitioner (chart 1). On the other hand, the patients from the EMR group were classified in an average of 3.72 groupings versus 3.41 for the DPIO group. For the same number of patients, the EMR GPs made more OIS than DPIO GPs.

Chart 1 - Analysis of the practitioners returns for both groups

	EMR users	DPIO users
Nb of physicians who transmitted	38	35
Nb of physicians analysed	36	33
Nb of patients	937	851
Females	551	479
Males	385	372
Average number of patients per physician	26	25.8
Number of groupings	3,489	2,920
Number of female grouping	2,038	1,685
Number of male groupings	1,448	1,235
Average grouping per physician	96.9	88.5

A statistical Z test set up to compare the averages shows a significant difference in the number of cancer who were detected, favorising the EMR group (Z= 96,87).

In both groups, the most detected cancer was colon cancer, the least detected being prostate cancer (chart 2).

Chart 2 - Repartition by DPIO and by groups of investigators

	EMR group		DPIO group	
	Groupings	%	Groupings	%
OIS MOUTH	575	16.5	413	14
OIS CERVIX	466	13.3	288	10
OIS COLON	673	19.3	637	22
OIS EPITHELIOMA	472	13.5	458	16
OIS MELANOMA	500	14.3	548	19
OIS PROSTATE	308	8.8	192	7
OIS BREAST	497	14.2	384	13
TOTAL OIS	3,491	100.00	2,920	100

The khi 2 homogeneity test is 63 for ddl at 6. There is a significant difference between the 20 groups (p< 0.0001).

Among the 3,489 groupings realised in the EMR group, 1,834 (52.5%) had the indicated risk factors.

Grouping correctly estimated by the practitioner
Grouping undervalued by the practitioner
Grouping overvalued by the practitioner

The practitioners could choose the degree of risk: 1 Non Concerned, 2 Average Risk, 3 Increased Risk, 4 Important Risk and 5 Very Important Risk.
There was no means of analysing the relevance of the answer for the practitioners who had not selected risk factors.
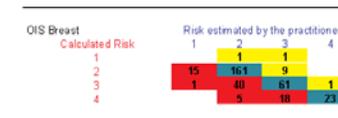
Chart 3 - Synthesis of the analysis of the degrees of risks for each OIS

	Risk (%)		
	Good	Overvalued	Undervalued
OIS MOUTH	70.39	3.91	25.70
OIS CERVIX	24.64	1.45	73.91
OIS COLON	81.73	9.13	9.13
OIS EPITHELIOMA	73.23	5.51	21.26
OIS MELANOMA	52.94	47.06	0.00
OIS PROSTATE	87.27	5.45	7.27
OIS BREAST	72.92	3.57	23.51
TOTAL OIS	67.36	6.62	26.03

OIS Breast Cancer

The rate of mistake for this risk grouping concerning breast cancer is of 27.1% with a majority of underestimation.
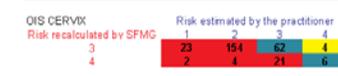
Chart 4 - Analysis of the degrees of risks estimated by the practitioners in the OIS Breast cancer

OIS Cervix Cancer

The estimation given by the practitioner of the risk grouping for the cancer of the cervix is in majority underestimated (chart 5).
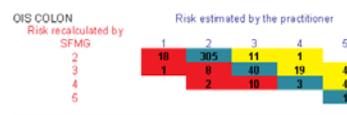
Chart 5 - Analysis of the degrees of risks estimated by the practitioners in the OIS Cancer of the cervix

OIS Colon Cancer

In the grouping concerning colon cancer, the rate of mistake is inferior to 20 % (chart 6).

Chart 6 - Analysis of the degrees of risks estimated by the practitioners in the OIS Cancer of the colon

OIS Epithélioma

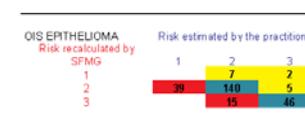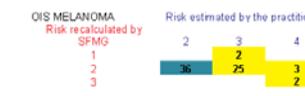For the grouping concerning epitheliome, the rate of mistake is of 26.8%.

Chart 7 - Analysis of the degrees of risks estimated by the practitioners in the OIS Epithelioma.

OIS Melanoma

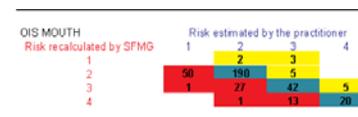For the grouping concerning melanoma, nearly half of

the cases were overestimated.

Chart 8 - Analysis of the degrees of risks estimated by the practitioners in the OIS Melanoma

OIS Mouth cancer

The analysis of the groupings concerning mouth cancer
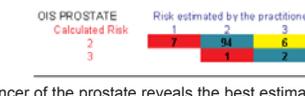

detecting shows an underestimation of the degree of risk for a quarter of the cases.

Chart 9 - Analysis of the degrees of risks estimated by the practitioners in the OIS Mouth Cancer

OIS Prostate cancer

With its rate of mistake of 12.7%, the grouping of the

cancer of the prostate reveals the best estimation realised by the investigating practitioners.

Chart 10 - Analysis of the degrees of risks estimated by the practitioners in the OIS Prostate

Discussion

These results show that the help of a software which is appropriate to cancer screening permits better precision in the estimation of the risk group of patients for 7 cancers; ultimately, it also brings a better screening beha-viour.

The number of risk groupings was more important for the EMR group; this can be explained by the fact they had benefited by the use of a known tool, by their computerised medical record as well as by an ergonomy they were used to handling.

One third of the groupings realised by the EMR group were erroneous. This can be explained by the fact that the practitioners used their memory and knowledge to analyse the risk factors but did not use an automatic way of calculating based on a ratified algorithm.

Half of the groupings from the EMR group did not include the risk factors considered by the practitioner to choose the risk group. This was a problem for the evaluation of the quality of the groupings. Yet, it is highly possible that the practitioners who indicated a risk group without choosing risk factors were not confident in their choices.

The SFMG is going to release this risk running software for 7 cancers to the French general practitioners, on a large scale and free of charge. It is going to put the algorithm of risk calculation at the disposal of the editors of medical software so as to allow them to issue it for their customers. Finally, the SFMG has just set up a
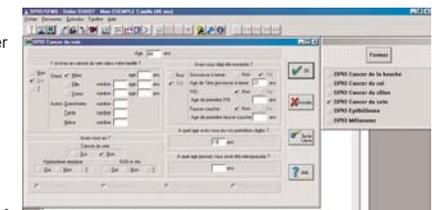
group to follow up and update the risk factors and the cancer screening behaviour.
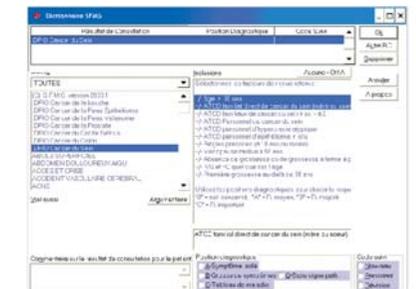
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