IMPLEMENTATION OF PARENTERAL NUTRITION PRESCRIBING SOFTWARE IN A NEONATAL INTENSIVE CARE UNIT

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Objectives

This study aimed to assess the interest of implementing software to help parenteral nutrition prescribers in neonatology healthcare unit.

Methods

This prospective comparative study was conducted in a neonatal unit during three months. It looked for evaluating the process of preparation of parenteral nutrition mixtures before and after the implementation of the prescribing software. This software was developed and validated by a team of doctors and pharmacists. The evaluation was performed by making a comparison between the errors that occurred during manual prescribing phase and those occurred during computerized phase. All steps of the process were assessed using a data collection sheet. Statistical analysis was performed by PSPP software.

Figure 1: ALIPAR® home screen

Results

Ordering stage

Fifty bags of parenteral nutrition were examined during each phases

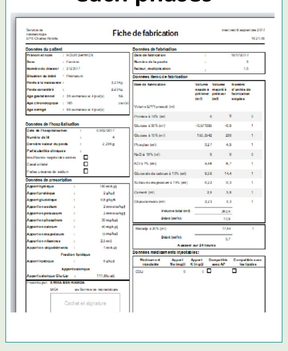

Figure 2: Production sheet

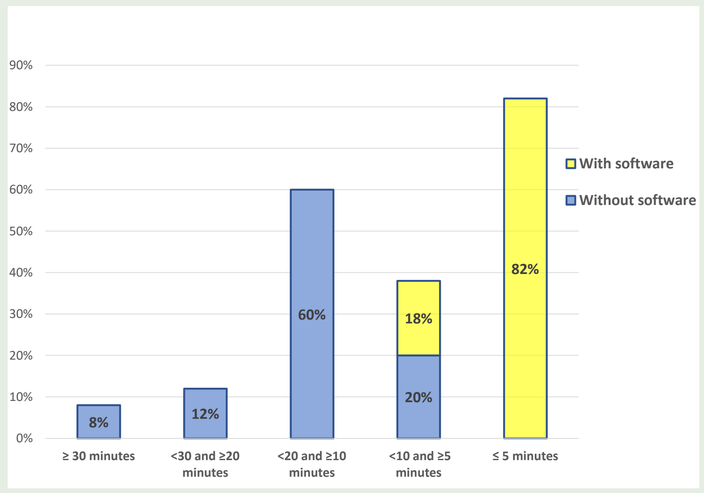

Figure 3: Duration of the prescribing action before and after the implementation of Alipar®

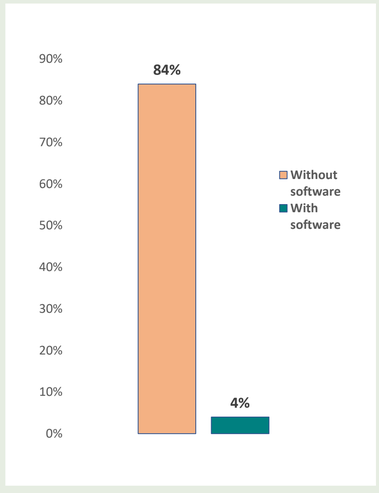

Figure 4 : Calculation errors before and after the implementation of Alipar®

	P	OR/cohorte	IC 95%
Considering sodium intake of the others drugs prescribed while calculating	< 10^{-3}	0.40	[0.30-0.58]
Considering fluid intake of the others drugs prescribed while calculating	< 10^{-3}	0.30	[0.19-0.45]
Calculation errors	< 10^{-3}	0.08	[0.02-0.039]
Total water calculation errors	< 10^{-3}	0.54	[0.42-0.70]
Carbohydrate calculation errors	< 10^{-3}	0.6	[0.48-0.75]
Protein calculation errors	< 10^{-3}	0.76	[0.65-0.89]
Sodium calculation errors	< 10^{-3}	0.76	[0.65-0.79]
Phosphore calculation errors	< 10^{-3}	0.98	[0.94-1.02]
Calcium calculation errors	< 10^{-3}	0.91	[0.84-0.99]
Flow calculation errors	< 10^{-3}	0.70	[0.58-0.84]
Multiplication errors	< 10^{-3}	0.88	[0.8-0.89]
Transcription errors	0.424	1.53	[0.53-4.42]

Table 1 : Comparison of indicators evaluating prescription stage before and after the implementation of Alipar®

Preparation stage

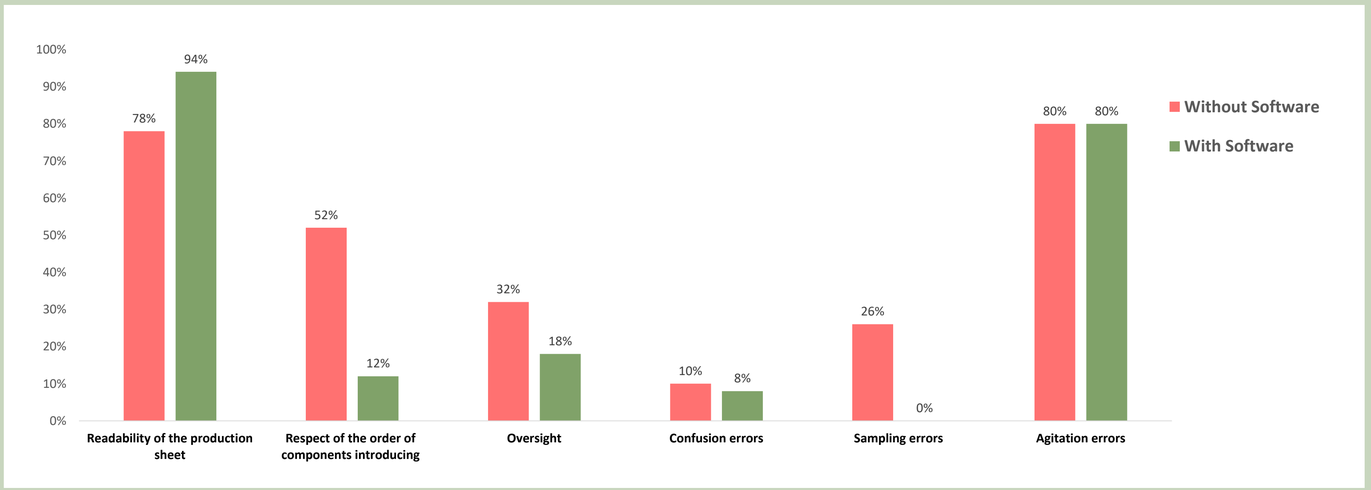

Figure 5 : Quality Indicators during preparation stage before and after the implementation of Alipar®

	P	OR/cohorte	IC 95%
Readability of the production sheet	0.041	0.22	[0.05-0.87]
Respect of the order of components introducing	< 10^{-3}	0.12	[0.04-0.35
Oversight	0.106	0.46	[0.18-1.18]
Confusion errors	1	0.78	[0.19-3.1]
Vitamin reconstitution	0.563	0.77	[0.63-0.95]
Bad conservation of the parenteral nutrition bags	< 10^{-3}	0.014	[0.04-0.052]
Sampling errors	< 10^{-3}	0.74	[0.62-0.87]
Agitation errors	1	1	[0.37-2.66]
Labeling	0.017	0.22	[0.06-0.74]

Table 2 : Comparison of indicators evaluating preparation stage before and after the implementation of Alipar®

Administration stage

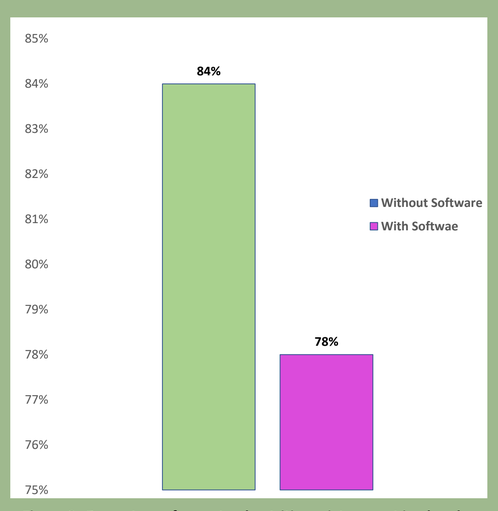

Figure 6 : Percentage of parenteral nutrition mixtures put in place by the nurse beyond 90 minutes delay before and after the implementation of Alipar®

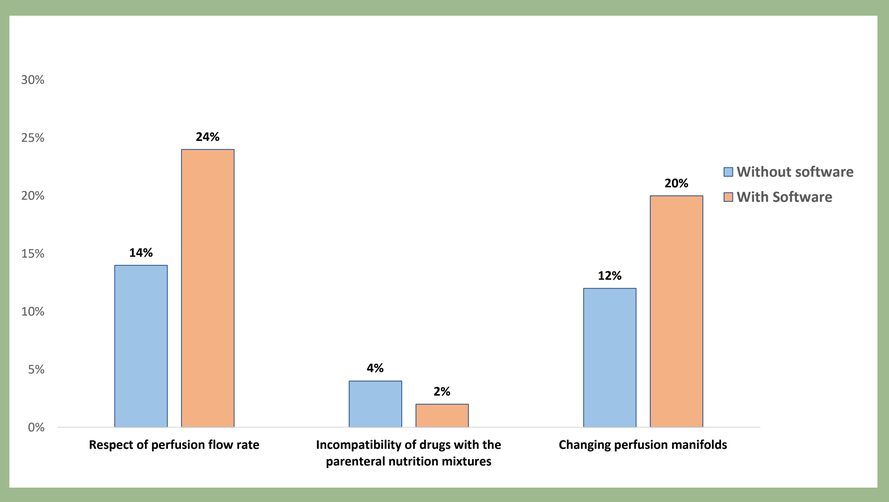

Figure 7 : Quality indicatos during administration stage before and after the implementation of Alipar®

Figure 5 : Traceability label of the parenteral nutrition mixture

	P	OR/cohorte	IC 95%
Administration à l'aide d'une pompe	0.315	0.66	[0.3-1.47]
Respect of perfusion flow rate	0.424	1.53	[0.53-4.54]
Incompatibility of drugs with the parenteral nutrition bugs	1	0.49	[0.04-5.58]
Changing perfusion manifolds	0.275	1.85	[0.6-5.5]

Table 3 : Comparison of parameters evaluating administration stage before and after the implementation of Alipar®

Discussion

In our study, the prescription time was significantly reduced by the implementation of ALIPAR®. This time saving represents approximately 90 to 120 minutes per day (8-12 prescriptions). Also, it was demonstrated that prescribing software reduce sampling errors (P <10^{-3}). Although the software does not impact directly the production step, but it steps in implicitly by improving the readability of the production sheet designed by the software.
Agitation is a crucial step during parenteral nutrition preparation which guarantees homogenization of the mixture. However this act is not done appropriately indicating the lack of staff training.

Conclusions

The implementation of the prescribing software was beneficial in terms of error management, time and traceability. The computerization of the process, from the prescription to the administration, is a necessity to guarantee security and efficiency in neonatal intensive care unit. Thus, it is recommended to generalize this pilot experiment in the interest of both prescriber and patient.

Bibliography

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